

Template for preparation of Practice Items for Mathematics Literacy

Theme - 1

Domain: Mathematical Literacy	Theme: BIRDS WING SPAN CHAPTER: Number System	Class : IX Expected Time : 8 minutes Total Credit: 8												
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">✓</td> <td style="padding: 2px;">Text</td> </tr> <tr> <td style="text-align: center;">✓</td> <td style="padding: 2px;">Image</td> </tr> <tr> <td></td> <td style="padding: 2px;">Table</td> </tr> <tr> <td></td> <td style="padding: 2px;">Graph</td> </tr> <tr> <td></td> <td style="padding: 2px;">Map</td> </tr> <tr> <td></td> <td style="padding: 2px;">Poem</td> </tr> </table>	✓	Text	✓	Image		Table		Graph		Map		Poem	Learning Outcomes: applies logical reasoning in classifying real numbers, proving their properties and using them in different situations.	
✓	Text													
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	Map													
	Poem													

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections, Reproduction
Overarching Idea	Quantity
Context	Personal
Item format	Short Response, MCQ
Cognitive Process	Evaluating, Inference
Proficiency Level	3

Description of Answer Key and Credits:

Credit Pattern:

Full Credit: 2

Partial Credit: 1

Nil Credit: 0

BIRDS WING SPAN

1.1

Full Credit: $\frac{19}{10}$ m

No Credit: other responses and missing

To answer the question correctly students have to draw on skills from the

1.2

Full Credit: 250 : 41

No Credit: other responses and missing

1.3

Full Credit: Albatross

No Credit: other responses and missing

1.4

Full Credit: (B) Golden Eagle

No Credit: other responses and missing

Template for preparation of Practice Items for Mathematics Literacy
Theme - 2

Domain: Mathematical Literacy	Theme : BIRTHDAY CELEBRATION CHAPTER: Number System	Class : IX Expected Time : 10 minutes Total Credit: 8
Description of items		Learning Outcomes: Students will be able to apply logical reasoning in classifying real numbers, proving their properties and using them in different situations.
✓	Text	
✓	Image	
	Table	
	Graph	
	Map	
	Poem	

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections, Reproduction
Overarching Idea	Quantity
Context	Personal, Educational and occupational
Item format	MCQ
Cognitive Process	Evaluating, Inference
Proficiency Level	4

Description of Answer Key and Credits:

Credit Pattern:

Full Credit: 2

Partial Credit: 1

Nil Credit: 0

Unit-2 BIRTHDAY CELEBRATION

2.1

Full Credit: (B) 3000

No Credit: other responses and missing

2.2

Full Credit: (D)

No Credit: other responses and missing

2.3

Full Credit: (A) 5700

No Credit: other responses and missing

2.4

Full Credit: (B) non terminating repeating

No Credit: other responses and missing

Template for preparation of Practice Items for Mathematics Literacy
Theme- 3

Domain: Mathematical Literacy	Theme: CHEESE PIZZA CHAPTER: Number System	Class : IX Expected Time : 2 minutes Total Credit: 2
Description of items		Learning Outcomes: applies logical reasoning in classifying real numbers, proving their properties and using them in different situations.
✓	Text	
✓	Image	
	Table	
	Graph	
	Map	
	Poem	

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections, Reproduction
Overarching Idea	Quantity
Context	Personal, Educational and occupational
Item format	MCQ
Cognitive Process	Evaluating, Inference
Proficiency Level	4

Description of Answer Key and Credits:

Credit Pattern:

Full Credit: 2

Partial Credit: 1

Nil Credit: 0

Unit-3 CHEESE PIZZA

3.1 Full Credit: (C) $\frac{1}{5}$

No Credit: other responses and missing

3.2

Full Credit: (D) $\frac{1}{56}$

No Credit: other responses and missing

3.3 Full Credit: (D) $\frac{1}{10}$

No Credit: other responses and missing

3.4 Full Credit: (C) $\frac{1}{n(n+1)}$

No Credit: other responses and missing

3.5 Full Credit: (A) $\frac{1}{(n+1)}$

No Credit: other responses and missing

Template for preparation of Practice Items for Mathematics Literacy Theme - 4

Domain: Mathematical Literacy	Theme: VEGETABLE GARDEN CHAPTER: Number System	Class : IX Expected Time : 10 minutes Total Credit: 10
Description of items		Learning Outcomes: applies logical reasoning in classifying real numbers, proving their properties and using them in different situations.
✓	Text	
	Image	
✓	Table	
	Graph	
	Map	
	Poem	

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections, Reproduction
Overarching Idea	Quantity
Context	Personal, Educational and occupational
Item format	Short answer, Complex MCQ
Cognitive Process	Evaluating, Inference
Proficiency Level	3

Description of Answer Key and Credits:

Credit Pattern:

Full Credit: 2

Partial Credit: 1

Nil Credit: 0

Unit-4 VEGETABLE GARDEN

4. 1

Full Credit: Ritu

No Credit: other responses and missing

4.2

Full Credit: 4 feet 6 inches

Partial Credit: equality of ratios is correct

No Credit: other responses and missing

4.3

Full Credit: 'No', 'Yes', 'Yes', 'No'

Partial Credit: if at least two responses are correct.

No Credit: other responses and missing

Template for preparation of Practice Items for Mathematics Literacy
Theme - 5

Domain: Mathematical Literacy	Theme: PEDOMETER CHAPTER: Number System	Class : IX Expected Time : 10 minutes Total Credit: 10
Description of items		Learning Outcomes: applies logical reasoning in classifying real numbers, proving their properties and using them in different situations.
✓	Text	
✓	Image	
✓	Table	
	Graph	
	Map	
	Poem	

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Quantity
Context	Personal, and occupational
Item format	Short answer, Complex MCQ
Cognitive Process	Evaluating, Inference
Proficiency Level	3

Description of Answer Key and Credits:

Credit Pattern:

Full Credit: 2

Partial Credit: 1

Nil Credit: 0

Unit-5 PEDOMETER

5.1

Full Credit: 3 days

Partial Credit: 1 day or 2 days

No Credit: other responses and missing

5.2

Full Credit: (C) Max value = 11400, Min value = 4500

No Credit: other responses and missing

5.3

Full Credit: (A) 5:4

No Credit: other responses and missing

5.4

Full Credit: 8287 (approx.)

Partial Credit: sum of the steps =49727 and the average is incorrect

No Credit: other responses and missing

5.5

Full Credit: 712 (approx.)

Partial Credit: difference is correct

No Credit: other responses and missing

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KVS Region	:	CHANDIGARH

CRITICAL AND CREATIVE THINKING ITEMS
CLASS IX : CHAPTER 1 : NUMBER SYSTEM
INDEX

S.No.	Theme of the item
1.	Birds Wing span
2.	Birthday celebration
3.	Cheese pizza
4.	Vegetable garden
5.	Pedometer

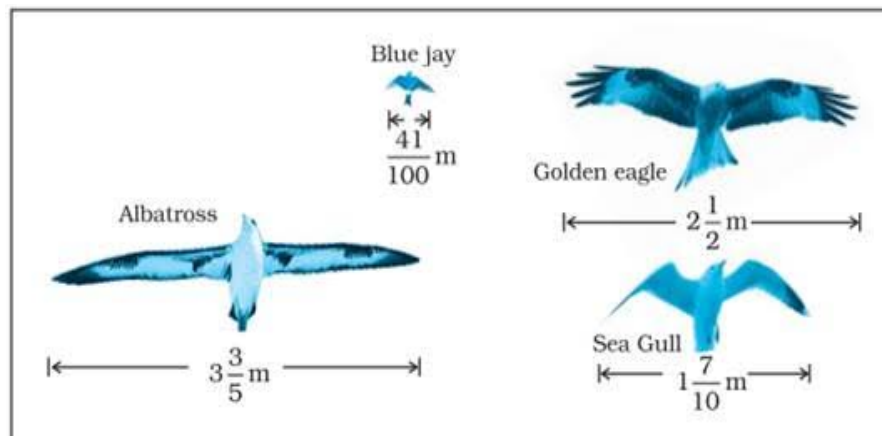
Theme – 1

Birds Wing span

Birds have many physical features, besides wings, that work together to enable them to fly. They need lightweight, streamlined, rigid structures for flight. The shape of a bird's wing is important for producing lift. The increased speed over a curved, larger wing area creates a longer path of air. This means the air is moving more quickly over the top surface of the wing, reducing air pressure on the top of the wing and creating lift. Also, the angle of the wing (tilted) deflects air downwards, causing a reaction force in the opposite direction and creating lift.



Larger wings produce greater lift than smaller wings. So the smaller-winged birds need to fly faster to maintain the same lift as those with larger wings. The diagram shows the wing spans of different species of birds. Use the diagram to answer the question given below:



Q1: How much longer is the wingspan of the Albatross than the wingspan of a Sea gull?

.....

Q2: Find the ratio of the wingspan of a Golden eagle to the wingspan of a Blue jay?

.....

Q3: As per the given information which bird can cover maximum distance in 10 minutes?

.....

Q4: If all birds shown in the figure were made to fly at the same time, then which one will be third from last?

- A) Albatross B) Golden Eagle C) Sea gull D) Blue Jay

Theme- 2

Birthday Celebration

Aryan was given Rs 20000 by his parents to arrange a party for his birthday. He planned to spend $\frac{1}{4}$ on food, $\frac{3}{10}$ of the remaining amount on decoration and $\frac{1}{3}$ of remaining on the return gifts to be given. His parents were very happy to see his planning as he could save some amount but suddenly they come to know that he needs Rs 10000 urgently as his friend needs his help.



Q1: How much money will Aryan borrow from his parents so that he can help his friend?

- (A) Rs 5500
- (B) Rs 3000
- (C) Rs 7000
- (D) Rs 6500

Q2: The amount that Aryan borrowed from his parents was

- (A) $\frac{3}{5}$ of amount what he got for birthday party
- (B) half of what he left after all expenses of birthday
- (C) $\frac{3}{5}$ of amount he spent on return gifts
- (D) $\frac{2}{3}$ of amount he spent on decoration

Q3: Aryan found that his friends gave him gifts which are equivalent to $\frac{3}{5}$ of amount that he spent on decoration and food. What was the amount on gifts that he received?

- (A) Rs 5700
- (B) Rs 4500
- (C) Rs 3600
- (D) Rs 5000

Q4: Had Aryan spent $\frac{5}{19}$ of the remaining amount (after decoration) on return gifts, then the amount left would be a number having decimal expansion

- (A) terminating and non-repeating
- (B) non terminating repeating
- (C) non terminating non-repeating
- (D) can't be determined

Q4: Based upon information given, what would be correct formula for fraction of pizza eaten on n^{th} day?

(A) $\frac{n}{n(n-1)}$

(B) $\frac{n}{n(n+1)}$

(C) $\frac{1}{n(n+1)}$

(D) $\frac{1}{n(n-1)}$

Q5: After 'n' days what would be the fraction of pizza left?

(A) $\frac{1}{(n+1)}$

(B) $\frac{n-1}{(n+1)}$

(C) $\frac{n}{(n+1)}$

(D) $\frac{1}{n(n-1)}$

Theme – 4
VEGETABLE GARDEN

Ritu and Meena grow vegetables in the rectangular garden in their backyard. They were standing in a garden on a sunny day. They noticed that the length of their shadow were of different lengths. Ritu measured Meena’s shadow and found it was 1.7m (66 inches appx.) long. Then Meena measured Ritu’s shadow and found it was 2.0m (78 inches appx.) long. The length of garden is ten times of Ritu’s shadow and breadth is ten times of Meena’s shadow.

Q1: Ritu is saying to Meena that she is taller than Meena . Is this statement is correct?

.....

Q2: If Ritu is 5 feet 4 inches tall, then how tall is Meena?

.....

Q3: If Ritu and Meena standing on opposite corner of garden. Which of the following can be drawn from this information? Click ‘Yes’ or “No’ for each conclusion.

Conclusion	Can this be drawn?
Distance between them is a rational no.	Yes/No
Distance between them is an irrational no.	Yes/No
Area of garden is 17 times its breadth	Yes/No
Perimeter of garden is twice the sum of their heights	Yes/No

Theme - 5 PEDOMETER

Mannu goes for a walk daily & counts the steps using pedometer and notes them in a diary. One of his diary pages shows the record of a week in the month of September. His daily target was 9000 steps.

Monday	9490 steps
Tuesday	$5^4 \times 2^4$ steps
Wednesday	6264 steps
Thursday	$2^6 \times 5^3$ steps
Friday	11435 steps
Saturday	4538 steps



Q:1 How many days did he achieve the daily target?
.....

Q2: After approximation and rounding off the daily steps to nearest 100, the maximum and minimum values among the approximations will be?

- (A) Max value = 10500, Min value = 4000
- (B) Max value = 12000, Min value = 3500
- (C) Max value = 11400, Min value = 4500
- (D) Max value = 11500, Min value = 4700

Q3: What is ratio of steps taken for Tuesday and Thursday?

- (A) 5:4
- (B) 4:25
- (C) 125:8
- (D) 5:16

Q4: Find the average steps he walked in a week.
.....

Q5: How many more steps he should take on so that his daily average steps for the week will be 9000?
.....

CRITICAL AND CREATIVE THINKING ITEMS

CLASS IX : CHAPTER 2 : POLYNOMIALS

INDEX

S.No.	Theme of the item
6.	Beautiful Birds
7.	Car Maintenance
8.	Gymnastics
9.	House Garden
10.	Pencil Box
11.	Daily Wages
12.	Investment
13.	Profit
14.	Ancestral property
15.	Gas Cylinders
16.	Graph of Polynomial
17.	Donation
18.	Mobile Showroom
19.	Taxi fare
20.	Visit to Tulip Garden, Srinagar
21.	Water tank
22.	Milkman
23.	Cake
24.	Fly away
25.	What's the Scoop?
26.	Fire worksKaboom
27.	Auto fare
S.No.	Theme of the item
28.	KVS VOLLEY Ball TOURNAMENT FOR STAFF
29.	Aquarium
30.	Simple Interest

31.	Picnic
32.	Super Market
33.	Grocery shop
34.	Combo offer

Domain: Mathematics literacy	Theme: Polynomials	Class:IX Expected time: 15 MIN. Total credit: 02												
Description of Item	Learning outcome: (as per NCERT) Forming expressions using the given conditions.													
<table border="1"> <tr><td>R</td><td>Text</td></tr> <tr><td>R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	R	Text	R	Image		Table		Graph		Map		Poem		
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1.1 Beautiful Birds



There are two groups of birds sitting on a tree. In the first group there are x numbers of birds and in the second y . The leader of the first group said to the leader of the second that if one bird from your group come to my side then the number of birds in my group is 4 more than 2 times number of birds in your group. The leader of the second group replied that if one bird from your group come to my side then the number of birds in my group is 3 less than five times the number of birds present in your group.

Given below are two statements. Are the statement correct?

Statement	Is the statement correct
For the first group leader statement, the number of birds is $2(y-1) + 4$	Yes/no
For the second group leader statement, the number of birds is $5(x+1) - 3$.	Yes/no

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Strategic competence
Overarching Idea	Relationships between variables
Context	Expressions
Item Format	Yes/no.
Cognitive process	Interpreting
Proficiency Level	2

Credit pattern :**Full credit:02****Partial credit:01****No credit:00****Description of Answer Key and Credits**

Explain expected answer and the respective credits
Yes for first and no for second.
F.C: 02
P.C: 01 [if anyone answer is correct]

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(1.2)

<u>Domain: Mathematics literacy</u>	<u>Theme: Polynomials</u>	<u>Class: IX</u> <u>Expected time: 05 Min.</u> <u>Total credit: 02</u>												
Description of Item <table border="1"><tr><td>P</td><td>Text</td></tr><tr><td></td><td>Image</td></tr><tr><td></td><td>Table</td></tr><tr><td></td><td>Graph</td></tr><tr><td></td><td>Map</td></tr><tr><td></td><td>Poem</td></tr></table>	P	Text		Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT). Finding the value of the polynomial.	
P	Text													
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	Poem													

If the number of birds in the second group is 16 in the beginning, find the number of birds in the first group if one bird come to this group from the second.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Procedural fluency
Overarching Idea	Relationships between variables
Context	Value of the polynomial
Item Format	Short response item
Cognitive process	Problem solving.
Proficiency Level	2

Credit pattern :

Full credit:02

Partial credit:01

No credit:00

Description of Answer Key and Credits

F.C: 34.
P.C: Proper substitution only
N.C: Any other response

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Item 2

(2.1)

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: Polynomials</u> Car Maintenance	<u>Class: IX</u> <u>Expected time: 10</u> <u>Min.</u> <u>Total credit: 02</u>												
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A pronto lube garage charges £25 to lube any vehicle. Other work adds about €6000 per month to the revenue. It costs pronto lube £6 in materials to service cars. Monthly operating expenses are €23,500. Write an expression for net profit for C cars.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Strategic competence
Overarching Idea	Relationships between variables
Context	Profit and loss
Item Format	Yes/no.
Cognitive process	Interpreting
Proficiency Level	3

Credit pattern :**Full credit:02****Partial credit:01****No credit:00****Description of Answer Key and Credits**

F.C: 19 C – 17,500

P.C: If Revenue or Costs is correct

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(2.2)

<u>Domain: Mathematics literacy</u>	<u>Theme: Polynomials</u>	<u>Class: IX</u> <u>Expected time: 05 Min.</u> <u>Total credit: 02</u>												
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R	Text													
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If the number of cars serviced in a particular month is 3000, find the profit

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Procedural fluency
Overarching Idea	Relationships between variables
Context	Value of a polynomial
Item Format	Short response item
Cognitive process	Problem solving.
Proficiency Level	2

Credit pattern :

Full credit:02

Partial credit:01

No credit:00

Description of Answer Key and Credits

€ 39, 500	F.C: 02
Proper substitution	P.C: 01.

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(2.3)

<u>Domain: Mathematics literacy</u>	<u>Theme: Polynomials</u>	<u>Class: IX</u> <u>Expected time: 05 Min.</u> <u>Total credit: 02</u>												
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	Graph													
	Map													
	Poem													

If the number of car serviced in a particular month is 900, then the garage got a profit.

True / false.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Procedural fluency
Overarching Idea	Mathematical understanding.
Context	Quantity.
Item Format	True/false.
Cognitive process	Interpreting.
Proficiency Level	2

Credit pattern :

Full credit:02

Partial credit:01

No credit:00

Description of Answer Key and Credits

False	F.C: 02
True	N.C.

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Item (3)

(3.1)

<p><u>Domain: Mathematics</u> <u>literacy</u></p>	<p><u>Theme: Polynomials</u> Gymnastics</p>	<p><u>Class: IX</u> <u>Expected time: 05</u> <u>Min.</u> <u>Total credit: 02</u></p>												
<p>Description of Item</p> <table border="1" data-bbox="220 674 632 904"> <tr> <td data-bbox="220 674 427 712">R</td> <td data-bbox="427 674 632 712">Text</td> </tr> <tr> <td data-bbox="220 712 427 750"></td> <td data-bbox="427 712 632 750">Image</td> </tr> <tr> <td data-bbox="220 750 427 788"></td> <td data-bbox="427 750 632 788">Table</td> </tr> <tr> <td data-bbox="220 788 427 826"></td> <td data-bbox="427 788 632 826">Graph</td> </tr> <tr> <td data-bbox="220 826 427 864"></td> <td data-bbox="427 826 632 864">Map</td> </tr> <tr> <td data-bbox="220 864 427 904"></td> <td data-bbox="427 864 632 904">Poem</td> </tr> </table>		R	Text		Image		Table		Graph		Map		Poem	<p>Learning outcome: (as per NCERT).</p> <p>Finding the value of the polynomial.</p>
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A gymnast dismounts the uneven parallel bars. Her height, h (feet), depends on the time, t (sec), that she is in the air as follows. $h = -16t^2 + 8t + 8$.

Where she will be after 1 second.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Strategic competency.
Overarching Idea	Change and relationship.
Context	Quantity.
Item Format	Short response item
Cognitive process	Problem solving.
Proficiency Level	2

Credit pattern :**Full credit:02****Partial credit:01****No credit:00****Description of Answer Key and Credits**

h = 0 (or) in the ground	F.C: 02
Proper substitution:	P.C: 01

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(3.2)

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: Polynomials</u>	<u>Class: IX</u> <u>Expected time: 05</u> <u>Min.</u> <u>Total credit: 02</u>												
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State the reason why when $t = 0$ and $t = \frac{1}{2}$ sec., she will be on the same height from the ground.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Procedural fluency
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Short response item
Cognitive process	Problem solving.
Proficiency Level	2

Credit pattern :

Full credit:02

Partial credit:01

No credit:00

Description of Answer Key and Credits

She will be at a height of 8 feet from the ground when $t=0$ and $t=\frac{1}{2}$ we get $h=8$. When $t=\frac{1}{2}$ she will go up and come up the same position.
F.C: 02
Any one substitution is correct i.e. $t=0$ (or) $t=\frac{1}{2}$
P.C: 01.

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


Phone No: 9427523022

Name of the vidyalaya: no1, OE, Trichy

KVS Region: Chennai

Item (4)

(4.1)

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: Polynomials</u> House Garden	<u>Class: IX</u> <u>Expected time:20 Min.</u> <u>Total credit: 02</u>												
Description of Item <table border="1"><tr><td></td><td>Text</td></tr><tr><td></td><td>Image</td></tr><tr><td></td><td>Table</td></tr><tr><td></td><td>Graph</td></tr><tr><td></td><td>Map</td></tr><tr><td></td><td>Poem</td></tr></table>		Text		Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT). Factorising the polynomials.	
	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													



Mr. Ramkumar has a beautiful rectangular garden and a swimming pool (in the form of a cuboid) in his luxurious bungalow. The area of the garden is $x^2 + 2x - 15$. What are the dimensions of the garden .

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Adaptive reasoning.
Overarching Idea	Change and relationship
Context	Area
Item Format	Short response item
Cognitive process	Problem solving.
Proficiency Level	3

Credit pattern :
Full credit:02
Partial credit:01

No credit:00

Description of Answer Key and Credits

Dimensions of the garden $(x+5)$ and $(x-3)$

F.C: 02

Any one dimension is correct

P.C: 01.

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(4.2)

<u>Domain: Mathematics literacy</u>	<u>Theme: Polynomials</u>	<u>Class: IX</u> <u>Expected time: 20 Min.</u> <u>Total credit: 02</u>												
Description of Item <table border="1"><tr><td>\mathbb{R}</td><td>Text</td></tr><tr><td></td><td>Image</td></tr><tr><td></td><td>Table</td></tr><tr><td></td><td>Graph</td></tr><tr><td></td><td>Map</td></tr><tr><td></td><td>Poem</td></tr></table>	\mathbb{R}	Text		Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT). Factorising the polynomials.	
\mathbb{R}	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													

The water capacity of the swimming pool upto the rim is $x^3-23x^2+142x-120$. What are the dimensions the swimming pool.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Adaptive reasoning.
Overarching Idea	Change and relationship
Context	Volume
Item Format	Short response item
Cognitive process	Problem solving.
Proficiency Level	3

Credit pattern :

Full credit:02

Partial credit:01

No credit:00

Description of Answer Key and Credits

Dimensions of the swimming pool $(x-1)$, $(x-10)$ and $(x-12)$

F.C: 02

Any one dimension is correct

P.C: 01.

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(4.3)

<u>Domain: Mathematics literacy</u>	<u>Theme: Polynomials</u>	<u>Class: IX</u> <u>Expected time:05 Min.</u> <u>Total credit: 02</u>												
Description of Item <table border="1" style="margin-left: 20px;"> <tr><td style="text-align: center;">R</td><td>Text</td></tr> <tr><td></td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		R	Text		Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT). Addition of polynomials.
R	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													

Find the perimeter of the garden.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Procedural fluency
Overarching Idea	Change and relationship
Context	Perimeter
Item Format	Short response item
Cognitive process	Problem solving.
Proficiency Level	2

Credit pattern :
Full credit:02
Partial credit:01
No credit:00

Description of Answer Key and Credits

Perimeter of the garden = $4x + 4$
 F.C: 02.
 Perimeter = $2(1 + b)$.
 P.C: 01.

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KVS Region: Chennai

(4.4)

<u>Domain: Mathematics literacy</u>	<u>Theme: Polynomials</u>	<u>Class: IX</u> <u>Expected time: 15 Min.</u> <u>Total credit: 02</u>												
Description of Item <table border="1" style="margin-left: 20px;"> <tr><td style="text-align: center;">R</td><td>Text</td></tr> <tr><td></td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		R	Text		Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT). Find the surface area without top as per the given dimensions and finding the value of polynomial
R	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													

The cost of painting the pool , if the cost of painting is Rs. 5/- per square unit.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Procedural fluency
Overarching Idea	Change and relationship
Context	Surface area
Item Format	Short response item
Cognitive process	Problem solving.
Proficiency Level	3

<u>Credit pattern :</u> <u>Full credit:02</u> <u>Partial credit:01</u> <u>No credit:00</u>

Description of Answer Key and Credits




F.C: 02 {if the cost is correct as per his/her assumed dimensions} P.C: 01 [if $A = lb + 2h(l + b).$]

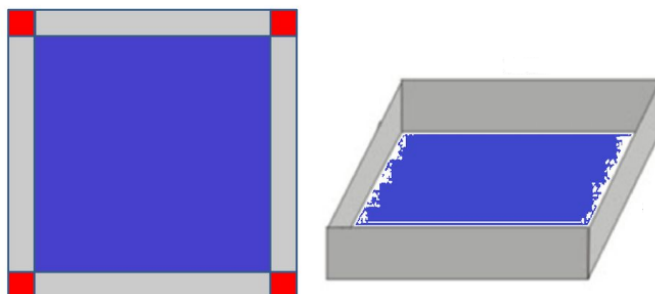
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 Name of the vidyalaya: no1, OE, Trichy
 KVS Region: Chennai

Item 5

(5.1)

<p><u>Domain: Mathematics</u> <u>literacy</u></p>	<p><u>Theme: Polynomials</u> Pencil Box</p>	<p><u>Class: IX</u> <u>Expected time: 10</u> <u>Min.</u> <u>Total credit: 02</u></p>												
<p>Description of Item</p> <table border="1" data-bbox="220 757 632 987"> <tr> <td data-bbox="220 757 427 797">  </td> <td data-bbox="427 757 632 797">Text</td> </tr> <tr> <td data-bbox="220 797 427 837"></td> <td data-bbox="427 797 632 837">Image</td> </tr> <tr> <td data-bbox="220 837 427 878"></td> <td data-bbox="427 837 632 878">Table</td> </tr> <tr> <td data-bbox="220 878 427 918"></td> <td data-bbox="427 878 632 918">Graph</td> </tr> <tr> <td data-bbox="220 918 427 958"></td> <td data-bbox="427 918 632 958">Map</td> </tr> <tr> <td data-bbox="220 958 427 987"></td> <td data-bbox="427 958 632 987">Poem</td> </tr> </table>			Text		Image		Table		Graph		Map		Poem	<p>Learning outcome: (as per NCERT).</p> <p>Form the polynomial and find its degree.</p>
	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													



Rekha wants to make a pencil box using a cardboard. When searching she got a cardboard with sides 12 inches by 12 inches. She cuts out four squares of equal size at corners and folding up the sides to make an open box. She paints it beautifully and puts all her pencils in that.

Suppose the side of the square cut-out is x inch. Give the polynomial to find the volume of the cuboid formed. And identify the degree of the polynomial.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Strategic competence
Overarching Idea	Mathematical relationship
Context	Volume
Item Format	Short response item
Cognitive process	Problem solving.
Proficiency Level	3

Credit pattern :

Full credit:02

Partial credit:01

No credit:00

Description of Answer Key and Credits

- a) Full credit: 02
Volume= $(12-2x)(12-2x)(x) = 4x^3 - 48x^2 + 144x$
Degree = 3
Partial credit: 01
If the expression is correct.
N.C: Any other response

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(5.2)

<u>Domain: Mathematics literacy</u>	<u>Theme: Polynomials</u>	<u>Class: IX</u> <u>Expected time:05 Min.</u> <u>Total credit: 02</u>												
Description of Item <table border="1"><tr><td></td><td>Text</td></tr><tr><td></td><td>Image</td></tr><tr><td></td><td>Table</td></tr><tr><td></td><td>Graph</td></tr><tr><td></td><td>Map</td></tr><tr><td></td><td>Poem</td></tr></table>		Text		Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT). Finding the value of polynomial .	
	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													

If the side of the square is 1 inch then what is the volume of the box?

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Procedural fluency
Overarching Idea	Change and relationship
Context	Volume
Item Format	Short response item
Cognitive process	Problem solving.
Proficiency Level	3

Credit pattern :

Full credit:02

Partial credit:01

No credit:00

Description of Answer Key and Credits

- b) Full credit: 02
X=1 inch, volume= $10 \times 10 \times 1 = 100$ sq.inch
Partial credit: 01
If the substitution is correct
No credit:
Any other response

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KVS Region: Chennai

(5.3)

<u>Domain: Mathematics literacy</u>	<u>Theme: Polynomials</u>	<u>Class: IX</u> <u>Expected time:05 Min.</u> <u>Total credit: 02</u>												
Description of Item <table border="1"><tr><td>R</td><td>Text</td></tr><tr><td></td><td>Image</td></tr><tr><td></td><td>Table</td></tr><tr><td></td><td>Graph</td></tr><tr><td></td><td>Map</td></tr><tr><td></td><td>Poem</td></tr></table>	R	Text		Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT). Basic conditions to make a cuboid/cube.	
R	Text													
	Image													
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	Graph													
	Map													
	Poem													

Can she make a box if the size of the square cut off is 6 inch? Why?

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Change and relationship
Context	Volume
Item Format	Short response item
Cognitive process	Problem solving.
Proficiency Level	3

Credit pattern :

Full credit:02

Partial credit:01

No credit:00

Description of Answer Key and Credits

<p>F.C: 02. No. Since if $x=6$, then the length and breadth become zero. P.C: 01 Substituting $x=6$.</p> <p>$X=1\text{cm}$, volume=$10 \times 10 \times 1=100\text{sq.inch}$</p>
--

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Name of the vidyalaya: no1, OE, Trichy

(5.4)

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme:</u> Polynomials	<u>Class: IX</u> <u>Expected time: 15</u> <u>Min.</u> <u>Total credit: 02</u>												
Description of Item <table border="1" style="margin-left: 20px;"> <tr><td style="text-align: center;">R</td><td>Text</td></tr> <tr><td></td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		R	Text		Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT). Total surface area of a cuboid.
R	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													

She closed the box and cover it with a cloth, find the area covered by the cloth.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Change and relationship
Context	Surface area
Item Format	Short response item
Cognitive process	Problem solving.
Proficiency Level	3

Credit pattern :**Full credit:02****Partial credit:01****No credit:00****Description of Answer Key and Credits**

F.C: 02 Area covered by the cloth = $(288 - 48x)$ sq.inch P.C: 01. $[A = 2(lb + bh + hl).]$ $X=1\text{cm}$, volume= $10 \times 10 \times 1 = 100\text{sq.inch}$







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Name of the vidyalaya: no1, OE, Trichy

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme:POLYNOMIAL</u> <u>S</u> <u>CONTEXT : 15</u> Daily Wages	<u>Class: IX</u> <u>Expected time: 5</u> <u>minutes</u> <u>Total credit:02</u>
Description of Item		Learning outcome: (as per NCERT) Students are expected to frame a polynomial for a situation.
	Text	
	Image	
	Table	
	Graph	
	Map	
	Poem	



15. Rama's daily wages is Rs x. On his promotion after 10 years the wage was enhanced with 5% of initial salary.

15.1. Represent Rama's salary after 10 years as a polynomial.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Very Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 1

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

<p>Full credit: $x + \frac{5x}{100}$ Partial credit: $\frac{5x}{100}$</p> <p>No credit: For any other response</p>
--

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KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme:POLYNOMIALS</u> <u>CONTEXT : 15</u>	<u>Class: IX</u> <u>Expected time: 3 minutes</u> <u>Total credit:02</u>
Description of Item		Learning outcome: (as per NCERT) Students are expected to frame a polynomial for a situation.
R	Text	
R	Image	
	Table	
	Graph	
	Map	
	Poem	



15.2. Rama's daily wages is Rs x. On his promotion after 10 years the wage was fixed as Rs 5x. His expected wage at the time of promotion is $5x^2$. The expected wage of Rama is Rs.50000.

15.2. Find his daily wage.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Very Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: $5x^2 = 50000$, $x = 100$
 Partial credit: $5x^2 = 50000$
 No credit: For any other response

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Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 16</u> Investment	<u>Class: IX</u> <u>Expected time: 6 minutes</u> <u>Total credit:02</u>												
Description of Item <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">R</td><td style="text-align: center;">Text</td></tr> <tr><td style="text-align: center;">R</td><td style="text-align: center;">Image</td></tr> <tr><td></td><td style="text-align: center;">Table</td></tr> <tr><td></td><td style="text-align: center;">Graph</td></tr> <tr><td></td><td style="text-align: center;">Map</td></tr> <tr><td></td><td style="text-align: center;">Poem</td></tr> </table>		R	Text	R	Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT) Students are expected to frame a polynomial for a situation.
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													

16. Ramani and her three friends invested Rs $10x^2$ (equal investment) for their export business. After 5 years the capital was enhanced to Rs 20000 including the profit. Their investment was increased 5% per annum.

16.1 Find the individual investment at the beginning of the business.



Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Very Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 4

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: Rs. 4000 Partial credit: Any other relevant answer
No credit: For any other response

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<u>Domain: Mathematics literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 16</u> Profit	<u>Class: IX</u> <u>Expected time: 2 minutes</u> <u>Total credit:02</u>
Description of Item		Learning outcome: (as per NCERT) Students are expected to frame a polynomial for a situation.
	Text	
	Image	
	Table	
	Graph	
	Map	
	Poem	

Ramani and her four friends invested Rs $10x^2$ for their export business. Their profit of investment was 5% per annum.

16.2. Express the profit after 5 years as a polynomial.



Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Very Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: $\frac{5x^2}{2}$ Partial credit: Any other relevant answer
No credit: For any other response

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KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 17</u> ancestral property	<u>Class: IX</u> <u>Expected time: 2 minutes</u> <u>Total credit:02</u>												
Description of Item <table border="1" style="width: 100%;"> <tr><td style="text-align: center;">R</td><td style="text-align: center;">Text</td></tr> <tr><td style="text-align: center;">R</td><td style="text-align: center;">Image</td></tr> <tr><td></td><td style="text-align: center;">Table</td></tr> <tr><td></td><td style="text-align: center;">Graph</td></tr> <tr><td></td><td style="text-align: center;">Map</td></tr> <tr><td></td><td style="text-align: center;">Poem</td></tr> </table>	R	Text	R	Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT) Students are expected to frame a polynomial for a situation.	
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													

. On partition of ancestral property, Kumar gave a rectangular plot to his son Gopu. The width of the plot was x units and length was five less than 7 times of its breath.

17.1 . Express the length as a polynomial.



Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Very Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: $7x - 5$ Partial credit: $7x$
No credit: For any other response

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<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme:POLYNOMIALS</u> <u>CONTEXT : 17</u>	<u>Class: IX</u> <u>Expected time: 2 minutes</u> <u>Total credit:02</u>
Description of Item		Learning outcome: (as per NCERT) Students are expected to frame a polynomial for a situation.
	Text	
	Image	
	Table	
	Graph	
	Map	
	Poem	

On partition of ancestral property, Kumar gave a rectangular plot to his son Gopu. The width of the plot was x units and length was five less than 7 times of its breath.

17.2. Represent the perimeter as a polynomial.



Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Very Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: $16x - 10$ Partial credit: $8x - 5$
No credit: For any other response

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KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme:POLYNOMIALS</u> <u>CONTEXT : 17</u>	<u>Class: IX</u> <u>Expected time: 2 minutes</u> <u>Total credit:02</u>												
Description of Item	Learning outcome: (as per NCERT)													
<table border="1"> <tr><td></td><td>Text</td></tr> <tr><td></td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		Text		Image		Table		Graph		Map		Poem	Students are expected to frame a polynomial for a situation.	
	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													

On partition of ancestral property, Kumar gave a rectangular plot to his son Gopu. The width of the plot was x units and length was five less than 7 times of its breath.

17.3. Form the polynomial to represent the area of the plot



Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Very Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: $7x^2 - 5x$ Partial credit: $x(7x - 5)$ No credit: For any other response

Name of the Teacher/Item Writer: K THANERAJ

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Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme:POLYNOMIALS</u> <u>CONTEXT : 17</u>	<u>Class: IX</u> <u>Expected time: 2 minutes</u> <u>Total credit:02</u>												
Description of Item <table border="1" style="margin-left: 20px;"> <tr><td style="text-align: center;">R</td><td>Text</td></tr> <tr><td style="text-align: center;">R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		R	Text	R	Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT) Students are expected to frame a polynomial for a situation.
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													

On partition of ancestral property, Kumar gave a rectangular plot to his son Gopu. The width of the plot was x units and length was five less than 7 times of its breath.

17.4 Express the perimeter if the length is increased by 2 units.



Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Very Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: $16x - 6$ Partial credit: Any considerable partial answer
 No credit: For any other response

Name of the Teacher/Item Writer: M MANIVANNAN

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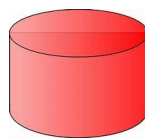
Email:mmanivannan20@gmail.com

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Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme:POLYNOMIALS</u> <u>CONTEXT : 18</u> Gas Cylinders	<u>Class: IX</u> <u>Expected time: 2 minutes</u> <u>Total credit:02</u>												
Description of Item <table border="1" style="width: 100%;"> <tr><td style="text-align: center;">R</td><td style="text-align: center;">Text</td></tr> <tr><td style="text-align: center;">R</td><td style="text-align: center;">Image</td></tr> <tr><td></td><td style="text-align: center;">Table</td></tr> <tr><td></td><td style="text-align: center;">Graph</td></tr> <tr><td></td><td style="text-align: center;">Map</td></tr> <tr><td></td><td style="text-align: center;">Poem</td></tr> </table>	R	Text	R	Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT) Students are expected to frame a polynomial for the situation and learning the multiplication of polynomials	
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													



As a safety measure a fuel gas organization recommended gas cylinder (assuming perfect cylinder) with the height $2x-1$ units and radius $2x + 1$ units.

18.1. Express the volume of the gas in the cylinder as a polynomial.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Very Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 3

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: $\pi (8x^3 + 4x^2 - 2x - 1)$ Partial credit: $\pi (2x - 1) (2x + 1)^2$
No credit: For any other response

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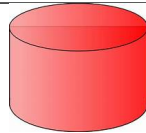
Phone No:8610859912

Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme:POLYNOMIALS</u> <u>CONTEXT : 18</u>	<u>Class: IX</u> <u>Expected time: 2 minutes</u>
---	---	---

		<u>Total credit:02</u>
Description of Item		Learning outcome: (as per NCERT) Students are expected to frame a polynomial for the situation and learning the multiplication of polynomials
R	Text	
R	Image	
	Table	
	Graph	
	Map	
	Poem	



As a safety measure a fuel gas organization recommended gas cylinder (assuming perfect cylinder) with the height $2x-1$ units and radius $2x + 1$ units.

18.2. Express the surface area of the cylinder as a polynomial

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Very Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 3

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: $8\pi(2x^2 + x)$ Partial credit: Any other relevant answer No credit: For any other response
--

Name of the Teacher/Item Writer: M MANIVANNAN

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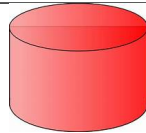
Phone No:9445368909

Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme:POLYNOMIALS</u> <u>CONTEXT : 18</u>	<u>Class: IX</u> <u>Expected time: 2 minutes</u>
---	---	---

		<u>Total credit:02</u>
Description of Item		Learning outcome: (as per NCERT) Students are expected to frame a polynomial for the situation and learning the multiplication of polynomials
R	Text	
R	Image	
	Table	
	Graph	
	Map	
	Poem	



As a safety measure a fuel gas organization recommended gas cylinder (assuming perfect cylinder) with the height $2x-1$ units and radius $2x + 1$ units.

18.3. Express the cost of painting the cylinder @ Rs 10 per Sq. units as a polynomial.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Very Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 3

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: $80\pi(2x^2+x)$ Partial credit: Any other relevant answer No credit: For any other response

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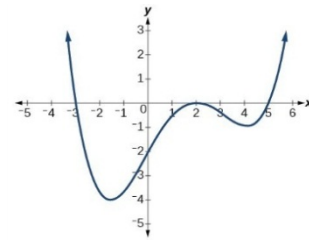
KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme:POLYNOMIALS</u> <u>CONTEXT : 19</u>	<u>Class: IX</u> <u>Expected time: 2 minutes</u>
---	---	---

		Graph of Polynomial	<u>Total credit:02</u>
Description of Item		Learning outcome: (as per NCERT)	
\mathbb{R}	Text	Students are expected to identify the nature of a polynomial function and find the degree and zero of the polynomial function from the graphical representation.	
	Image		
	Table		
\mathbb{R}	Graph		
	Map		
	Poem		

The graph represents a polynomial expression.

19.1 What is the degree of the polynomial?



Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Very Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: 4
Partial credit: No
No credit: For any other response

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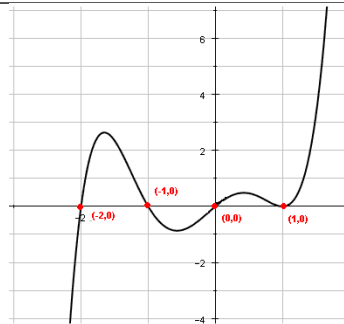
Phone No: 9445368909

Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 19</u>	<u>Class: IX</u> <u>Expected time: 2 minutes</u>
---	--	---

		Total credit:02
Description of Item		Learning outcome: (as per NCERT) Students are expected to identify the nature of a polynomial function and find the degree and zero of the polynomial function from the graphical representation.
R	Text	
	Image	
	Table	
R	Graph	
	Map	
	Poem	



The above graph represents a polynomial expression.

19.2. Write the number of zeroes and also the zeroes of the polynomial.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Very Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: 4 , Zeroes -2, -1, 0 , 1 Partial credit: portion of the answer
 No credit: For any other response

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KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 20</u> Donation	<u>Class: IX</u> <u>Expected time: 5 minutes</u> <u>Total credit:02</u>												
Description of Item <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 20%; text-align: center;">R</td><td>Text</td></tr> <tr><td style="text-align: center;">R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		R	Text	R	Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT) Students are expected to identify the nature of a polynomial function and find the zero of the polynomial function
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													

Raveena donated Rupees $\left(x^3 + \frac{1}{x^3}\right)$ to buy books for the mission. Her friends wanted to know the amount donated by Raveena. She did not disclose the amount but gave a hint that $\left(x + \frac{1}{x}\right) = \text{Rs } 15$.



20.1 Find the amount donated by Raveena.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 5

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: $\left(x^3 + \frac{1}{x^3}\right) = \left(x + \frac{1}{x}\right) \left(x^2 - 2 + \frac{1}{x^2}\right) = 3330$ Partial credit : Finding $\left(x^2 + \frac{1}{x^2}\right) = 223$ No credit : Any other response

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Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics</u>	<u>Theme: POLYNOMIALS</u>	<u>Class: IX</u>
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<u>literacy</u>	<u>CONTEXT : 21</u> Mobile Showroom	<u>Expected time: 5 minutes</u> <u>Total credit:02</u>
Description of Item		Learning outcome: (as per NCERT) Students are able to identify the correct polynomial and find the value of the polynomial at specific value of the variable.
\mathbb{R}	Text	
\mathbb{R}	Image	
	Table	
	Graph	
	Map	
	Poem	



Keshavowns a Mobile showroom of a popular brand . The number of mobiles sold by the shop can be modelled by the expression $N(t) = 7t+25$ and the Selling price per mobile is modelled by an expression

$S(t)= 2t^2+25t + 12$ where t is the number of months in a year.

21.1 Find the number of mobiles sold in one and half years

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 4

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: $N(18) = 7(18) + 25 = 151$

Partial credit: $N(18) = 7(18) + 25$

No credit: Any other response

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Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<p align="center"><u>Domain: Mathematics</u> <u>literacy</u></p>	<p align="center"><u>Theme:POLYNOMIAL</u> <u>S</u> <u>CONTEXT : 9-2</u></p>	<p align="center"><u>Class: IX</u> <u>Expected time: 5</u> <u>minutes</u> <u>Total credit:02</u></p>												
<p>Description of Item</p> <table border="1" data-bbox="193 479 576 710"> <tr><td align="center">R</td><td>Text</td></tr> <tr><td align="center">R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	R	Text	R	Image		Table		Graph		Map		Poem	<p>Learning outcome: (as per NCERT) Children are able to factorise the polynomial and finding the product of the polynomials.</p>	
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													



Keshavowns a Mobile showroom of a popular brand . The number of mobiles sold by the shop can be modelled by the expression $N(t) = 7t+25$ and the Selling price per mobile is modelled by an expression

$S(t)= 2t^2+25t + 12$ where t is the number of months in a year.

21.2 Choose the expression which show the amount of revenue generated by the showroom

- a) $(2t + 1)(t-12)(7t +25)$
- b) $(2t + 1)(t+12)(7t +25)$
- c) $(7t+25)(2t-1)(t+12)$
- d)none of these

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Short Answer type
Cognitive process	Interpreting
Proficiency Level	Level 5

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: 1 Option B ($2t + 1$)($t+12$)($7t +25$) ---[$N(t) \times S(t)$]

Partial credit: Writing $N(t)$ or $S(t)$

No credit: Any other response

Name of the Teacher/Item Writer: M MANIVANNAN

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Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics literacy</u>	<u>Theme: POLYNOMIAL</u> <u>S</u> <u>CONTEXT : 21</u>	<u>Class: IX</u> <u>Expected time: 5 minutes</u> <u>Total credit:02</u>												
Description of Item <table border="1" style="width: 100%;"> <tr><td style="text-align: center;">R</td><td>Text</td></tr> <tr><td style="text-align: center;">R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	R	Text	R	Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT) Children are able to find the value of the polynomial at particular value of the variable.	
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													



Keshav owns a Mobile showroom of a popular brand. The number of mobiles sold by the shop can be modelled by the expression $N(t) = 7t+25$ and the Selling price per mobile is modelled by an expression

$S(t) = 2t^2 + 25t + 12$ where t is the number of months in a year.

21.3 What is the total amount of revenue generated by the showroom at the end of the year?

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 6

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full credit: $N(12) \times S(12) = 109 \times 600 = 65400$
Partial credit: Finding $N(12)$ and $S(12)$ alone
No credit: Any other response

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Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 21</u>	<u>Class: IX</u> <u>Expected time: 2 minutes</u> <u>Total credit:02</u>												
Description of Item <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 20px; text-align: center;">R</td><td>Text</td></tr> <tr><td style="text-align: center;">R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		R	Text	R	Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT) Children are able to find the value of the polynomial at particular value of the variable.
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													



Keshav owns a Mobile showroom of a popular brand. The number of mobiles sold by the shop can be modelled by the expression $N(t) = 7t+25$ and the Selling price per mobile is modelled by an expression

$S(t) = 2t^2 + 25t + 12$ where t is the number of months in a year.

21.4 If the cost of production per mobile is modelled by an expression $C(t) = t^2 + 5t + 6$, find the expression that gives the profit earned per mobile

- a) $t^2 - 20t + 3$
- b) $t^2 + 20t + 6$
- c) $2t^2 + 30t + 18$
- d) $t^2 - 10t + 6$

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :
Full credit:02
Partial credit:01
No credit:0

Description of Answer Key and Credits

Full Credit: 2 Option B ($t^2+20t + 6$)
 $S(t) - C(t) = (2t^2+25t + 12) - (t^2 + 5t + 6) = (t^2+20t + 6)$
Partial credit: $(2t^2+25t + 12) - (t^2 + 5t + 6)$
No credit: Any other response

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KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 21</u>	<u>Class: IX</u> <u>Expected time: 5 minutes</u> <u>Total credit:02</u>												
Description of Item <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 20%; text-align: center;">R</td><td>Text</td></tr> <tr><td style="text-align: center;">R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		R	Text	R	Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT) Children are able to understand the concept of profit and loss applying in polynomials.
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													



Keshav owns a Mobile showroom of a popular brand. The number of mobiles sold by the shop can be modelled by the expression $N(t) = 7t+25$ and the Selling price per mobile is modelled by an expression

$S(t) = 2t^2 + 25t + 12$ where t is the number of months in a year.

21.5 Find the profit earned by the showroom at the end of the year.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 4

Credit pattern :
Full credit:02
Partial credit:01
No credit:0

Description of Answer Key and Credits

Full Credit: Profit per mobile $=t^2+20t + 6 = 12^2 + 20(12) + 6 = 144 + 240 + 6 =390$
No of mobiles sold per year $N(12) = 109$
Total profit earned $= 390 \times 109 = 42510$
Partial credit: Finding 109 or 390
No credit: Any other response

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<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 22</u> Taxi fare	<u>Class: IX</u> <u>Expected time: 3 minutes</u> <u>Total credit:02</u>												
Description of Item	Learning outcome: (as per NCERT) Children are able to write the polynomial expression for the taxi Fare for a particular distance travelled.													
<table border="1"> <tr><td style="text-align: center;">R</td><td>Text</td></tr> <tr><td style="text-align: center;">R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	R	Text	R	Image		Table		Graph		Map		Poem		
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													

The taxi fare in Coimbatore city for **Taxi Green Cab** is as follows: For the first kilometre, the fare is Rsx. and for the subsequent distance in km it is Rs 3 less than the fare of first kilometre.



But for the **Speed Track**, the taxi fare is as follows: For the first kilometre, the fare is Rs45 and for the subsequent distances it is Rs30/km.

22.1 Write the expression for the taxi fare to travel 10 kilometres in Coimbatore city by **Taxi Green Cab**

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full Credit: Taxi fare = $10x - 27$

Partial credit: No partial credit.

No credit: Any other response

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Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 22</u>	<u>Class: IX</u> <u>Expected time: 3 minutes</u> <u>Total credit:02</u>												
Description of Item <table border="1" style="width: 100%;"> <tr><td style="text-align: center;">R</td><td>Text</td></tr> <tr><td style="text-align: center;">R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		R	Text	R	Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT) Children are able to compare the taxi fare.
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													

The taxi fare in Coimbatore city for **Taxi Green Cab** is as follows: For the first kilometre, the fare is Rsx and for the subsequent distance, it is Rs 10 less than the fare of first kilometre.



But for the **Speed Track**, the taxi fare is as follows: For the first kilometre, the fare is Rs45 and for the subsequent distances it is Rs30/km.

22.2 Which taxi is economical when we plan a trip of 200km travel and how much when minimum fare for first kilometre by Taxi Green cab is Rs30

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full Credit: Taxi Green cab is more economical by Rs 2005
 Partial credit: Taxi fare for both the cabs as Rs4010 and Rs6015
 No credit: Any other response

Name of the Teacher/Item Writer: K THANERAJ

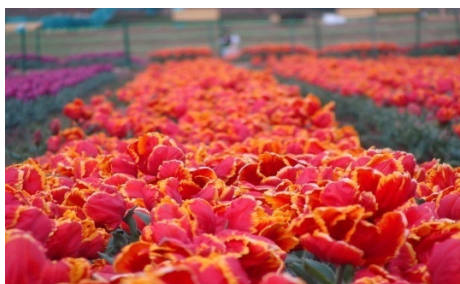
Designation:PGT (Mathematics)

Email:thanerajmaths@gmail.com

Phone No:8610859912 Name of the vidyalaya: KV Anna Nagar KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 23</u>	<u>Class: IX</u> <u>Expected time: 3 minutes</u> <u>Total credit:02</u>
Description of Item		Learning outcome: (as per NCERT) Children are able to form the polynomial for the concept given.
R	Text	
R	Image	
	Table	
	Graph	
	Map	
	Poem	

Visit to Tulip Garden, Srinagar



Indira Gandhi Memorial Tulip garden is a [tulip](#) garden in [Srinagar, Kashmir](#). It is the largest [tulip](#) garden in [Asia](#) spread over an area of about 30 hectares. It is situated on the foothills of [Zabarwan Range](#) with an overview of [Dal Lake](#). The garden was opened in 2007. The garden is built on a sloping ground in a terraced fashion consisting of seven terraces. Apart from tulips, many other species of flowers - [hyacinths](#), [daffodils](#) and [ranunculus](#) have been added as well.

Lakshmi and her friends visited Srinagar, the summer capital of Jammu and Kashmir. They visited the famous tulip garden and were fascinated by a particular way the tulips were arranged in an area. The area of a part of the garden which is in the shape of a rectangle is 10 more than the sum of 7 times the number of plants in one row and the square of the number of plants in the same row.

23.1 Frame the polynomial function for the area of that part of the garden

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full Credit: $X^2 + 7x + 10$

Partial credit: No partial credit

No credit: Any other response

Name of the Teacher/Item Writer: M MANIVANNAN

Designation:TGT (Mathematics)

Email:mmanivannan20@gmail.com

Phone No:9445368909

Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 23</u>	<u>Class: IX</u> <u>Expected time: 3 minutes</u> <u>Total credit:02</u>												
Description of Item <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 20%; text-align: center;">R</td><td>Text</td></tr> <tr><td style="text-align: center;">R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		R	Text	R	Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT) Students are able to find one dimension of the rectangular garden compare with other dimension
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													

Visit to Tulip Garden, Srinagar



Indira Gandhi Memorial Tulip garden is a [tulip](#) garden in [Srinagar, Kashmir](#). It is the largest [tulip](#) garden in [Asia](#) spread over an area of about 30 hectares. It is situated on the foothills of [Zabarwan Range](#) with an overview of [Dal Lake](#). The garden was opened in 2007. The garden is built on a sloping ground in a terraced fashion consisting of seven terraces. Apart from tulips, many other species of flowers - [hyacinths](#), [daffodils](#) and [ranunculus](#) have been added as well.

Lakshmi and her friends visited Srinagar, the summer capital of Jammu and Kashmir. They visited the famous tulip garden and were fascinated by a particular way the tulips were arranged in an area. The area of a part of the garden which is in the shape of a rectangle is 10 more than the sum of 7 times the number of plants in one row and the square of the number of plants in the same row.

23.2 If the length of the rectangle is 5 more than the number of plants in one row, find the breadth.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

<u>Credit pattern :</u> <u>Full credit:02</u> <u>Partial credit:01</u> <u>No credit:0</u>
--

Description of Answer Key and Credits

Full Credit: x +2
Partial credit: No partial credit
No credit: Any other response

Name of the Teacher/Item Writer: K THANERAJ

Designation:PGT (Mathematics)

Email:thanerajmaths@gmail.com

Phone No:8610859912

Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme:POLYNOMIALS</u> <u>CONTEXT : 23</u>	<u>Class: IX</u> <u>Expected time: 3 minutes</u> <u>Total credit:02</u>
Description of Item		Learning outcome: (as per NCERT) Students are able to represent the perimeter of a garden as a polynomial
<u>R</u>	Text	
<u>R</u>	Image	
	Table	
	Graph	
	Map	
	Poem	

Visit to Tulip Garden, Srinagar



Indira Gandhi Memorial Tulip garden is a [tulip](#) garden in [Srinagar, Kashmir](#). It is the largest [tulip](#) garden in [Asia](#) spread over an area of about 30 hectares. It is situated on the foothills of [Zabarwan Range](#) with an overview of [Dal Lake](#). The garden was opened in 2007. The garden is built on a sloping ground in a terraced fashion consisting of seven terraces. Apart from tulips, many other species of flowers - [hyacinths](#), [daffodils](#) and [ranunculus](#) have been added as well.

Lakshmi and her friends visited Srinagar, the summer capital of Jammu and Kashmir. They visited the famous tulip garden and were fascinated by a particular way the tulips were arranged in an area. The area of a part of the garden which is in the shape of a rectangle is 10 more than the sum of 7 times the number of plants in one row and the square of the number of plants in the same row.

23.3 Find the perimeter of the garden

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :
Full credit:02
Partial credit:01
No credit:0

Description of Answer Key and Credits

Full Credit: $4x + 14$

Partial credit: No partial credit

No credit: Any other response

Name of the Teacher/Item Writer: M MANIVANNAN

Designation: TGT (Mathematics)

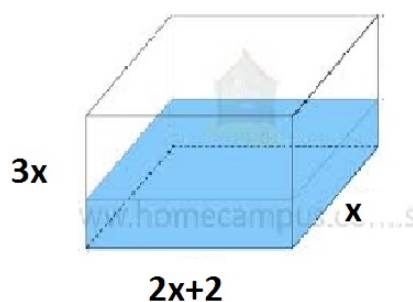
Email: mmanivannan20@gmail.com

Phone No: 9445368909

Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 24</u> Water tank	<u>Class: IX</u> <u>Expected time: 3 minutes</u> <u>Total credit:02</u>											
Description of Item		Learning outcome: (as per NCERT) Children are able to find the area of the floor as a polynomial expression.											
<table border="1"> <tr><td style="text-align: center;">R</td><td style="text-align: center;">Text</td></tr> <tr><td style="text-align: center;">R</td><td style="text-align: center;">Image</td></tr> <tr><td></td><td style="text-align: center;">Table</td></tr> <tr><td></td><td style="text-align: center;">Graph</td></tr> <tr><td></td><td style="text-align: center;">Map</td></tr> <tr><td></td><td style="text-align: center;">Poem</td></tr> </table>	R		Text	R	Image		Table		Graph		Map		Poem
R	Text												
R	Image												
	Table												
	Graph												
	Map												
	Poem												



Raju constructs an open cuboidal water tank for his house. He wants to cement the floor of the tank and white wash the walls of the tank. If the length of the tank is 2 more than twice the breadth of the tank and the height is three times the breadth of the tank.

24.1 Represent the area of the floor as a polynomial expression.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern :

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full Credit: $2x^2+2x$ Partial credit: No partial credit No credit: Any other response
--

Name of the Teacher/Item Writer: K THANERAJ

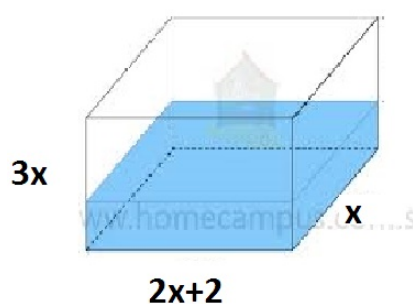
Designation:PGT (Mathematics)

Email:thanerajmaths@gmail.com

Phone No:8610859912

Name of the vidyalaya: KV Anna Nagar

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 24</u>	<u>Class: IX</u> <u>Expected time: 3 minutes</u> <u>Total credit:02</u>
Description of Item		Learning outcome: (as per NCERT) Children are able to express a polynomial expression for the four walls to be white washed
R	Text	
R	Image	
	Table	
	Graph	
	Map	
	Poem	



Raju constructs an open cuboidal water tank for his house. He wants to cement the floor of the tank and white wash the walls of the tank. If the length of the tank is 2 more than twice the breadth of the tank and the height is three times the breadth of the tank.

24.2 Find a polynomial expression for finding area of the four walls to be white washed

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern:

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full Credit: $18x^2+12x$
 Partial credit: No partial credit
 No credit: Any other response







Name of the Teacher/Item Writer: M MANIVANNAN

Designation:PGT (Mathematics)

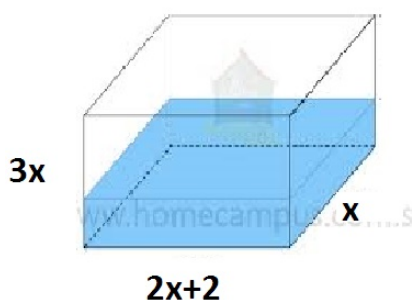
Email:mmanivannan20@gmail.com

Phone No:9445368909

Name of the vidyalaya: KV Anna Nagar

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIAL</u> <u>S</u> <u>CONTEXT : 24</u>	<u>Class: IX</u> <u>Expected time: 3</u> <u>minutes</u> <u>Total credit:02</u>												
Description of Item	Learning outcome: (as per NCERT) Children are able to express a polynomial expression for the volume of the tank.													
<table border="1"> <tr><td></td><td>Text</td></tr> <tr><td></td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		Text		Image		Table		Graph		Map		Poem		
	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													

Raju constructs an open cuboidal water tank for his house. He wants to cement the floor of the tank and white wash the walls of the tank. If the length of the tank is 2 more than twice the breadth of the tank and the height is three times the breadth of the tank.



24.3 Find a polynomial expression for the volume of the tank.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern:

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full Credit: $6x^3+6x^2$

Partial credit: No partial credit

No credit: Any other response

Email: thanerajmaths@gmail.com

Phone No: 8610859912

Name of the vidyalaya: KV Anna Nagar

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 25</u> Milkman	<u>Class: IX</u> <u>Expected time: 3 minutes</u> <u>Total credit:02</u>
Description of Item		Learning outcome: (as per NCERT) Children are able to find the volume of the container.
R	Text	
R	Image	
	Table	
	Graph	
	Map	
	Poem	



A milkman is having one milk container. The number of litres in the container is given by the expression $x^4 + x^3 - 2x^2 + x + 1$ (where $x > 0$). He sells the equal litres of milk to each people daily in DAE Township, Kalpak am.

25.1 The number of peoples that he sells in the first avenue is given by the expression $(x-1)$. What will be the quantity of milk remaining in the container (in litres)?

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

Credit pattern:
Full credit:02
Partial credit:01
No credit:0

Description of Answer Key and Credits

Full Credit: 2

Partial credit: No partial credit

No credit: Any other response

Name of the Teacher/Item Writer: M MANIVANNAN

Designation:PGT (Mathematics)

Email:mmanivannan20@gmail.com

Phone No:9445368909

Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>Domain: Mathematics</u> <u>literacy</u>	<u>Theme: POLYNOMIALS</u> <u>CONTEXT : 25</u>	<u>Class: IX</u> <u>Expected time: 3 minutes</u> <u>Total credit:02</u>												
Description of Item <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">R</td><td style="text-align: center;">Text</td></tr> <tr><td style="text-align: center;">R</td><td style="text-align: center;">Image</td></tr> <tr><td></td><td style="text-align: center;">Table</td></tr> <tr><td></td><td style="text-align: center;">Graph</td></tr> <tr><td></td><td style="text-align: center;">Map</td></tr> <tr><td></td><td style="text-align: center;">Poem</td></tr> </table>		R	Text	R	Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT) Children are able to find the volume of the container.
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													



A milkman is having one milk container. The number of litres in the container is given by the expression $x^4 + x^3 - 2x^2 + x + 1$ (where $x > 0$). He sells the equal litres of milk to each people daily in DAE Township, Kalpakkam.

25.2 The number of peoples that he sells in the second avenue is given by the expression $x-2$. How many litres of milk is left out in the container?

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 2

<u>Credit pattern:</u> <u>Full credit:02</u> <u>Partial credit:01</u> <u>No credit:0</u>

Description of Answer Key and Credits

Full Credit: 19
Partial credit: No partial credit
No credit: Any other response

Name of the Teacher/Item Writer: K THANERAJ



Designation:PGT (Mathematics)

Email:thanerajmaths@gmail.com

Phone No:8610859912

Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<u>literacy</u>	<u>CONTEXT : 26</u> <u>Cake</u>	<u>Expected time: 5 minutes</u> <u>Total credit:02</u>
Description of Item		Learning outcome: (as per NCERT) Children are able to find the height from the volume of the container.
	Text	
	Image	
	Table	
	Graph	
	Map	
	Poem	



A new bakery offers decorated cakes for children's birthday parties and other special occasions. The volume of a small cake is given by the expression $3x^4 - 3x^3 - 33x^2 + 54x$.

26.1 The length of a cake is given by $3x$ and the width is given by $x-2$. Find the height of the cake.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competancy cluster	Conceptual understanding
Overarching Idea	Changes and relations
Context	Societal
Item Format	Long Answer type
Cognitive process	Interpreting
Proficiency Level	Level 4

Credit pattern:

Full credit:02

Partial credit:01

No credit:0

Description of Answer Key and Credits

Full Credit: x^2+x-9
 Partial credit: No partial credit
 No credit: Any other response

Name of the Teacher/Item Writer: M MANIVANNAN







Designation: TGT (Mathematics)

Email: mmanivannan20@gmail.com

Phone No: 9445368909

Name of the vidyalaya: KV Anna Nagar

KVS Region: Chennai

<p align="center"><u>Domain: Mathematics literacy</u></p>	<p align="center"><u>Theme: POLYNOMIALS</u></p>	<p align="center"><u>Class: IX</u> <u>Expected time: 3 minutes</u> <u>Total credit: 2</u></p>												
<p>Description of Item</p> <table border="1" data-bbox="193 371 603 607"> <tr><td></td><td>Text</td></tr> <tr><td></td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		Text		Image		Table		Graph		Map		Poem	<p>Learning outcome: (as per NCERT)</p> <p>The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.</p>	
	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													

31.2 Write a quadratic polynomial for the revenue R.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	employing mathematical concepts
Overarching Idea	Change and relationships
Context	Occupational
Item Format	Short Answer
Cognitive process	Skill
Proficiency Level	1

Full credit: 02 $R = 4480 - 633m - m^2$

Partial credit: 01 No partial credit

No credit: 00 :other response / no response

<u>Domain: Mathematics literacy</u>	<u>Theme: POLYNOMIALS</u>	<u>Class: IX</u> <u>Expected time: 2 minutes</u> <u>Total credit: 2</u>
Description of Item	Learning outcome: (as per NCERT)	
R	Text	
R	Image	
	Table	
	Graph	
	Map	
	Poem	
	The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.	

32.2 If the volume of box is 48 cubic feet , then find the height

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	employing mathematical concepts
Overarching Idea	Space and Shape
Context	Scientific
Item Format	Short Answer
Cognitive process	Skill
Proficiency Level	2

Full credit: 02 $x^3+6x^2+8x=48$ solving we get $x=2$

Partial credit: 01 $x^3+6x^2+8x=48$

No credit: 00 :other response / no response

<p><u>Domain: Mathematics literacy</u></p>	<p><u>Theme: POLYNOMIAL S</u></p>	<p><u>Class: IX</u> <u>Expected time: 2minutes</u> <u>Total credit: 2</u></p>												
<p>Description of Item</p> <table border="1" data-bbox="193 409 592 640"> <tr><td>\mathbb{R}</td><td>Text</td></tr> <tr><td>\mathbb{R}</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	\mathbb{R}	Text	\mathbb{R}	Image		Table		Graph		Map		Poem	<p>Learning outcome: (as per NCERT)</p> <p>The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.</p>	
\mathbb{R}	Text													
\mathbb{R}	Image													
	Table													
	Graph													
	Map													
	Poem													



Item : (33) Fly away







33.1 The distance between Washington, D.C., and San Francisco is 2800 miles. An airplane flies at a speed of 400 miles per hour in still air. Suppose a wind of w miles per hour blows from west to east across the country. Write a rational expression for the time for a flight from San Francisco to Washington, D.C. Then write a second rational expression for the time for a flight from Washington D.C., to San Francisco

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	formulating situations mathematically
Overarching Idea	Space and Shape
Context	Scientific
Item Format	Short Answer
Cognitive process	Skill
Proficiency Level	3

Description of Answer Key and Credits

<p><u>Full credit: 02</u> $\frac{2800}{400+w}$ hr. $\frac{2800}{400-w}$ hr.</p>
<p><u>Partial credit: 01</u> writing any one expression correctly</p>
<p><u>No credit: 00</u> :other response / no response</p>

<p align="center"><u>Domain: Mathematics literacy</u></p>	<p align="center"><u>Theme: POLYNOMIALS</u></p>	<p align="center"><u>Class: IX</u> <u>Expected time: 3 minutes</u> <u>Total credit: 2</u></p>												
<p>Description of Item</p> <table border="1" data-bbox="193 371 603 607"> <tr><td></td><td>Text</td></tr> <tr><td></td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		Text		Image		Table		Graph		Map		Poem	<p>Learning outcome: (as per NCERT)</p> <p>The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.</p>	
	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													

33.2 What is the flight time in each direction if the wind speed is 10 miles per hour ?

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	employing mathematical concepts
Overarching Idea	Space and Shape
Context	Scientific
Item Format	Short Answer
Cognitive process	Skill
Proficiency Level	1

Full credit: 02 About 6 hr 50 min ; About 7 hr 11 min

Partial credit: 01 Writing any one correctly

No credit: 00 :other response / no response

<u>Domain: Mathematics literacy</u>	<u>Theme:POLYNOMIALS</u>	<u>Class:IX</u> <u>Expected time: 3 minutes</u> <u>Total credit: 2</u>												
<u>Domain: Mathematics literacy</u>	<u>Theme:POLYNOMIAL S</u>	<u>Class: IX</u> <u>Expected time: 2minutes</u> <u>Total credit: 2</u>												
Description of Item	Learning outcome: (as per NCERT)													
<table border="1"> <tr><td><u>R</u></td><td>Text</td></tr> <tr><td><u>R</u></td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	<u>R</u>	Text	<u>R</u>	Image		Table		Graph		Map		Poem	<p>The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.</p>	
<u>R</u>	Text													
<u>R</u>	Image													
	Table													
	Graph													
	Map													
	Poem													



Item : (34) What's the Scoop?

34.1 For their ice cream stores , Scoops wants to design a new cone that is 12cm high and holds $\frac{1}{4}$ litre (250cm³) of ice cream when completely filled and topped with a hemispherical scoop. Give a polynomial function $V(r)$ for the volume of the cone and hemisphere?

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	formulating situations mathematically
Overarching Idea	Space and Shape
Context	Scientific
Item Format	Short Answer
Cognitive process	Skill
Proficiency Level	3

Description of Answer Key and Credits

<p><u>Full credit: 02</u> $V(r) = \frac{2}{3} [\pi r^3 + 4\pi r^2]$ <u>Partial credit: 01</u> writing any one expression correctly <u>No credit: 00</u> :other response / no response</p>

Description of Item		Learning outcome: (as per NCERT) The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.
	Text	
	Image	
	Table	
	Graph	
	Map	
	Poem	

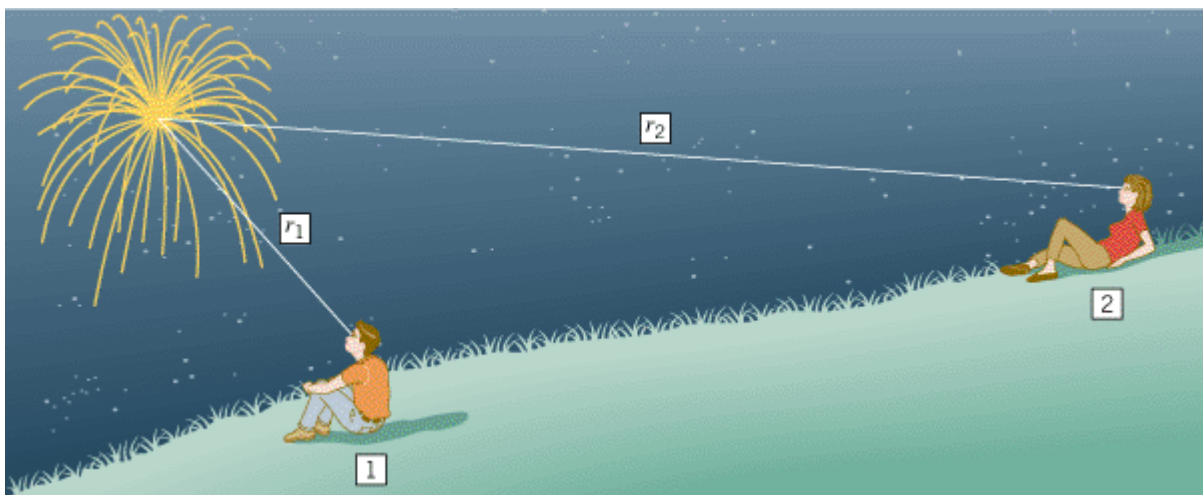
34.2 What radius the cone should be in order to hold $\frac{1}{4}$ litre

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	employing mathematical concepts
Overarching Idea	Space and Shape
Context	Scientific
Item Format	Short Answer
Cognitive process	Skill
Proficiency Level	1

Full credit: 02 About 3.54 cm
Partial credit: 01 no partial credit
No credit: 00 :other response / no response

<p><u>Domain: Mathematics literacy</u></p>	<p><u>Theme: POLYNOMIAL S</u></p>	<p><u>Class: IX</u> <u>Expected time: 4minutes</u> <u>Total credit: 2</u></p>												
<p>Description of Item</p> <table border="1"> <tr><td>R</td><td>Text</td></tr> <tr><td>R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	R	Text	R	Image		Table		Graph		Map		Poem	<p>Learning outcome: (as per NCERT)</p> <p>The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.</p>	
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													



Item : (35) Fire worksKaboom

35.1 During a fireworks display, a rocket explodes high in the air, as above figure. Assume that the sound spreads out uniformly in all directions and that reflections from the ground can be ignored. When the sound reaches listener 2, who is $r_2 = 640$ m away from the explosion, the sound has an intensity of $I_2 = 0.10$ W/m². What is the sound intensity detected by listener 1, who is $r_1 = 160$ m away from the explosion?

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	formulating situations mathematically
Overarching Idea	Space and Shape
Context	Scientific
Item Format	Short Answer
Cognitive process	Skill
Proficiency Level	3

Description of Answer Key and Credits

Full credit: 02

$$\frac{I_1}{I_2} = \frac{\frac{P}{4\pi r_1^2}}{\frac{P}{4\pi r_2^2}} = \frac{r_2^2}{r_1^2} = \frac{(640 \text{ m})^2}{(160 \text{ m})^2} = 16$$

$$I_1 = (16)I_2 = (16)(0.10 \text{ W/m}^2) = \boxed{1.6 \text{ W/m}^2}.$$

Partial credit: 01 16

No credit: 00 :other response / no response

<u>Domain: Mathematics literacy</u>	<u>Theme: POLYNOMIALS</u>	<u>Class: IX</u> <u>Expected time: 2minutes</u> <u>Total credit: 2</u>												
Description of Item <table border="1" data-bbox="193 409 592 638"> <tr><td><input type="checkbox"/></td><td>Text</td></tr> <tr><td><input type="checkbox"/></td><td>Image</td></tr> <tr><td><input type="checkbox"/></td><td>Table</td></tr> <tr><td><input type="checkbox"/></td><td>Graph</td></tr> <tr><td><input type="checkbox"/></td><td>Map</td></tr> <tr><td><input type="checkbox"/></td><td>Poem</td></tr> </table>	<input type="checkbox"/>	Text	<input type="checkbox"/>	Image	<input type="checkbox"/>	Table	<input type="checkbox"/>	Graph	<input type="checkbox"/>	Map	<input type="checkbox"/>	Poem	Learning outcome: (as per NCERT) The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.	
<input type="checkbox"/>	Text													
<input type="checkbox"/>	Image													
<input type="checkbox"/>	Table													
<input type="checkbox"/>	Graph													
<input type="checkbox"/>	Map													
<input type="checkbox"/>	Poem													



Item 36 : Auto fare

36.1 The Auto fare is found as minimum Rs. `25 for 3 kilo meter and thereafter Rs. ` 12 per kilo meter. Which of the following equations represents the relationship between the total cost 'c' in rupees and the number of kilometers n?

- (a) $c = 25 + n$ (b) $c = 25 + 12n$ (c) $c = 25 + (n-3)12$ (d) $c = (n-3)12$

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	formulating situations mathematically
Overarching Idea	Change and relationship
Context	Occupational
Item Format	MCQ
Cognitive process	Knowledge
Proficiency Level	2

Description of Answer Key and Credits

<u>Full credit: 02 c</u> <u>Partial credit:</u> no partial credit <u>No credit: 00</u> :other response / no response

<p><u>Domain: Mathematics literacy</u></p>	<p><u>Theme: POLYNOMIAL</u> <u>S</u></p>	<p><u>Class: IX</u> <u>Expected time: 3minutes</u> <u>Total credit: 2</u></p>												
<p>Description of Item</p> <table border="1"> <tr> <td data-bbox="193 472 389 510">R</td> <td data-bbox="395 472 587 510">Text</td> </tr> <tr> <td data-bbox="193 512 389 551">R</td> <td data-bbox="395 512 587 551">Image</td> </tr> <tr> <td data-bbox="193 553 389 591"></td> <td data-bbox="395 553 587 591">Table</td> </tr> <tr> <td data-bbox="193 593 389 631"></td> <td data-bbox="395 593 587 631">Graph</td> </tr> <tr> <td data-bbox="193 633 389 672"></td> <td data-bbox="395 633 587 672">Map</td> </tr> <tr> <td data-bbox="193 674 389 712"></td> <td data-bbox="395 674 587 712">Poem</td> </tr> </table>	R	Text	R	Image		Table		Graph		Map		Poem	<p>Learning outcome: (as per NCERT)</p> <p>The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.</p>	
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													



Item 37 : KVS VOLLEY Ball TOURNAMENT FOR STAFF

37.1 KVS has organized Volley ball tournament for KVS staff during winter break 2019 in Bhubaneswar. The number of volleyball games that must be scheduled in a league with n teams is given by $G(n) = \frac{n^2 - 23n}{2}$ where each team plays with every other team exactly once. A league schedules 25 games. How many teams are in the league?

- (a) 2 (b) 25 (c) 30 (d) 20

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	formulating situations mathematically
Overarching Idea	Quantity
Context	Societal
Item Format	MCQ
Cognitive process	Knowledge
Proficiency Level	2

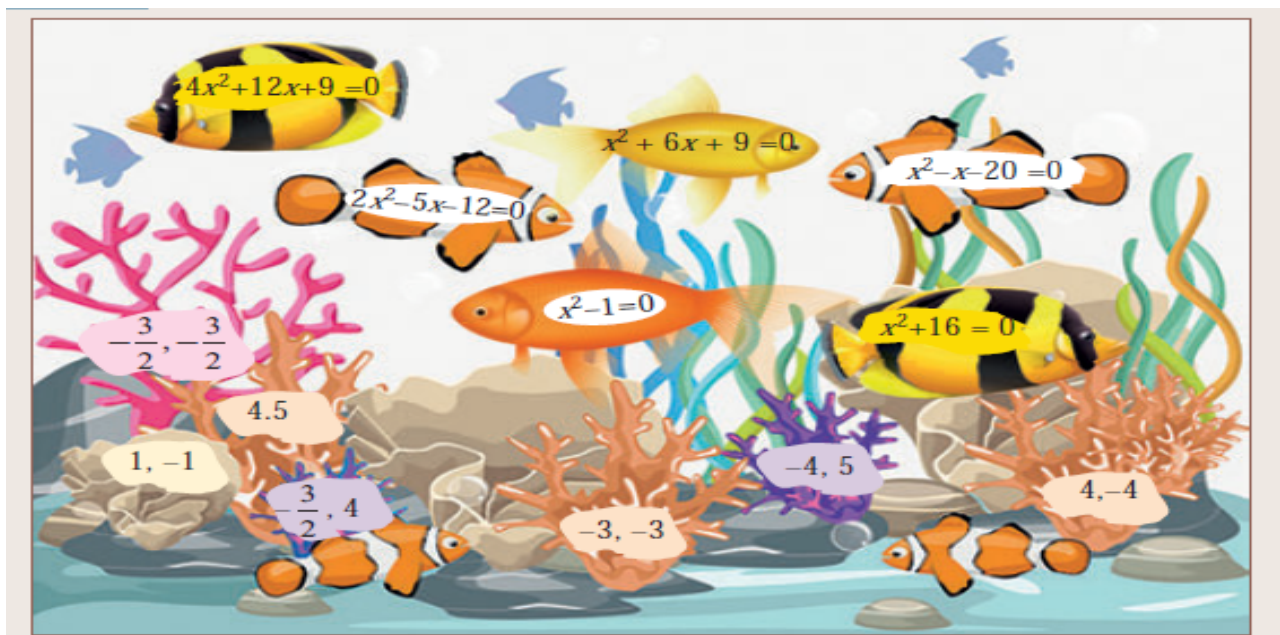
Description of Answer Key and Credits

Full credit: 02 b

Partial credit: no partial credit

No credit: 00 :other response / no response

<u>Domain: Mathematics literacy</u>	<u>Theme: POLYNOMIALS</u>	<u>Class: IX</u> <u>Expected time: 2minutes</u> <u>Total credit: 2</u>												
Description of Item <table border="1" style="width: 100%;"> <tr><td style="width: 10%; text-align: center;">R</td><td>Text</td></tr> <tr><td style="text-align: center;">R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		R	Text	R	Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT) The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													



Item 38 : Aquarium

38.1 Serve the fishes (Equations) with its appropriate food (real roots). Identify a fish which cannot be served?



















- (a) $x^2 - 1 = 0$ (b) $4x^2 + 12x + 9 = 0$ (c) $x^2 + 16 = 0$ (d) $x^2 - x - 20 = 0$

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	formulating situations mathematically
Overarching Idea	Quantity
Context	Personal
Item Format	MCQ
Cognitive process	Knowledge
Proficiency Level	1

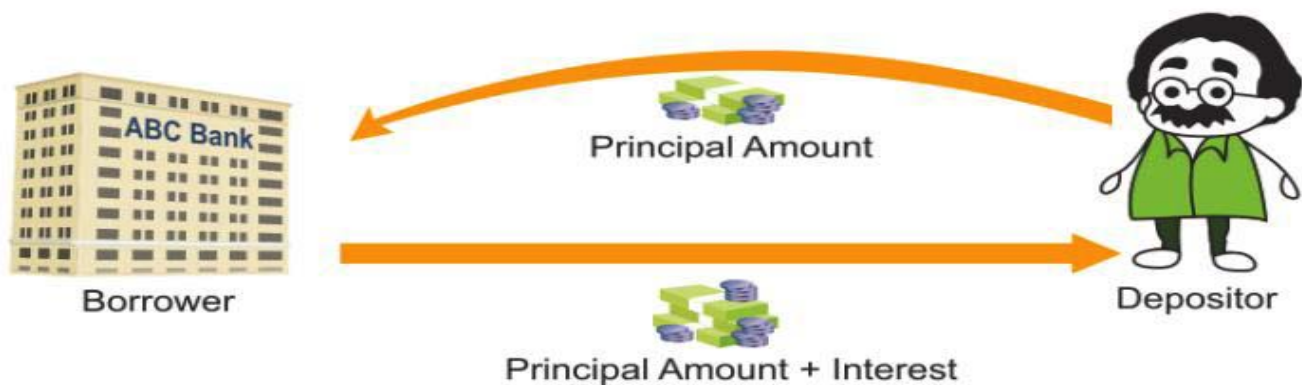
Description of Answer Key and Credits

<p><u>Full credit: 02</u> c</p> <p><u>Partial credit:</u> no partial credit</p> <p><u>No credit: 00</u> :other response / no response</p>
--

<u>Domain: Mathematics literacy</u>	<u>Theme: POLYNOMIALS</u>	<u>Class: IX</u> <u>Expected time: 2minutes</u> <u>Total credit: 2</u>												
Description of Item	Learning outcome: (as per NCERT) The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.													
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	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													

Interest calculated on the original principal throughout the holding period.

$$\text{Simple Interest} = \frac{\text{Principal} \times \text{Time} \times \text{Rate of Interest}}{100} = \frac{\text{PTR}}{100}$$



Item 39 : Simple Interest

39.1 Find the simple interest on Rs. $x^2 - xy + y^2$ for 10 years at $(x+y)\%$ per annum.

- (a) $x^3 + y^3$ (b) $x^3 - y^3$ (c) $10(x^3 + y^3)$ (d) $0.1(x^3 + y^3)$

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	formulating situations mathematically
Overarching Idea	Quantity
Context	Personal
Item Format	MCQ
Cognitive process	Knowledge
Proficiency Level	1

Description of Answer Key and Credits

Full credit: 02 d

Partial credit: no partial credit

No credit: 00 :other response / no response

<p><u>Domain: Mathematics literacy</u></p>	<p><u>Theme: POLYNOMIAL</u> <u>S</u></p>	<p><u>Class: IX</u> <u>Expected time: 2minutes</u> <u>Total credit: 2</u></p>												
<p>Description of Item</p> <table border="1"> <tr> <td data-bbox="193 472 389 510">R</td> <td data-bbox="395 472 587 510">Text</td> </tr> <tr> <td data-bbox="193 512 389 551">R</td> <td data-bbox="395 512 587 551">Image</td> </tr> <tr> <td data-bbox="193 553 389 591"></td> <td data-bbox="395 553 587 591">Table</td> </tr> <tr> <td data-bbox="193 593 389 631"></td> <td data-bbox="395 593 587 631">Graph</td> </tr> <tr> <td data-bbox="193 633 389 672"></td> <td data-bbox="395 633 587 672">Map</td> </tr> <tr> <td data-bbox="193 674 389 712"></td> <td data-bbox="395 674 587 712">Poem</td> </tr> </table>	R	Text	R	Image		Table		Graph		Map		Poem	<p>Learning outcome: (as per NCERT)</p> <p>The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.</p>	
R	Text													
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	Poem													



Item 40 : Picnic

40.1 Mohan working in Chennai plans to go to Ooty along with his family during summer vacation by his own car. He drives his car at a uniform speed of $(x + 8)$ km/hr. and had driven the car $(x + 8)$ hours. Find the distance between Chennai and Ooty as Polynomial.

- (a) (x^2+64) km (b) $(x^2+16x+64)$ km (c) $(x^2+8x+64)$ km (d) $(x^2+16x+16)$ km

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	formulating situations mathematically
Overarching Idea	Change and relationship
Context	Personal
Item Format	MCQ
Cognitive process	Knowledge
Proficiency Level	2

Description of Answer Key and Credits

Full credit: 02 b

Partial credit: no partial credit

No credit: 00 :other response / no response

<p><u>Domain: Mathematics literacy</u></p>	<p><u>Theme: POLYNOMIAL S</u></p>	<p><u>Class: IX</u> <u>Expected time: 2minutes</u> <u>Total credit: 2</u></p>												
<p>Description of Item</p> <table border="1"> <tr> <td data-bbox="193 472 389 510">R</td> <td data-bbox="395 472 587 510">Text</td> </tr> <tr> <td data-bbox="193 512 389 551">R</td> <td data-bbox="395 512 587 551">Image</td> </tr> <tr> <td data-bbox="193 553 389 591"></td> <td data-bbox="395 553 587 591">Table</td> </tr> <tr> <td data-bbox="193 593 389 631"></td> <td data-bbox="395 593 587 631">Graph</td> </tr> <tr> <td data-bbox="193 633 389 672"></td> <td data-bbox="395 633 587 672">Map</td> </tr> <tr> <td data-bbox="193 674 389 712"></td> <td data-bbox="395 674 587 712">Poem</td> </tr> </table>	R	Text	R	Image		Table		Graph		Map		Poem	<p>Learning outcome: (as per NCERT)</p> <p>The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.</p>	
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													



Item 41 : Super Market

41.1 Reema used a polynomial in more than once when she went for shopping. She went to a super market AmbikaApplam at Adyar Chennai and wanted to know how much half of a kg of sugar, three kg of flour, two dozen eggs and three packets of milk cost. Construct a simple polynomial, letting "f" denote the price of flour, "e" denote the price of a dozen eggs "m" the price of a packet of milk and "s" the price of Sugar

Mathematical Literacy



















FRAMEWORK	CHARACTERISTICS
Competency cluster	formulating situations mathematically
Overarching Idea	Change and relationship
Context	Personal
Item Format	Short Answer
Cognitive process	Knowledge
Proficiency Level	2

Description of Answer Key and Credits

Full credit: 02 $3f + 2e + 3m + 0.5s$

Partial credit: no partial credit

No credit: 00 :other response / no response

<p align="center"><u>Domain: Mathematics literacy</u></p>	<p align="center"><u>Theme: POLYNOMIAL</u> <u>S</u> <u>Grocery shop</u></p>	<p align="center"><u>Class: IX</u> <u>Expected time: 2minutes</u> <u>Total credit: 2</u></p>												
<p>Description of Item</p> <table border="1"> <tr><td></td><td>Text</td></tr> <tr><td></td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		Text		Image		Table		Graph		Map		Poem	<p>Learning outcome: (as per NCERT)</p> <p>The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.</p>	
	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													



41.2 If sugar costs Rs 60 per kg, flour costs Rs. 50 per kg, eggs cost Rs 60 a dozen and milk costs Rs. 30 a packet, she will be charged ----- Rupees

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Employing Mathematical Concepts, facts, porcedures and reasoning
Overarching Idea	Change and relationship
Context	Personal



















Item Format	Short Answer
Cognitive process	Knowledge
Proficiency Level	2

Description of Answer Key and Credits

Full credit: 02 Rs.390

Partial credit: no partial credit

No credit: 00 :other response / no response

<p><u>Domain: Mathematics literacy</u></p>	<p><u>Theme: POLYNOMIALS</u> <u>Combo offer</u></p>	<p><u>Class: IX</u> <u>Expected time: 2minutes</u> <u>Total credit: 2</u></p>												
<p>Description of Item</p> <table border="1"> <tr><td></td><td>Text</td></tr> <tr><td></td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>		Text		Image		Table		Graph		Map		Poem	<p>Learning outcome: (as per NCERT)</p> <p>The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.</p>	
	Text													
	Image													
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	Graph													
	Map													
	Poem													



41.3 To attract the customers the shopkeeper offered combo price “if you purchase, three kg of flour, two dozen eggs and three packets of milk” then 0.5kg sugar at free of cost. In this case what is the cost of three kg of flour, two dozen eggs, three packets of milk and 0.5kg sugar?

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Employing Mathematical Concepts, facts, porcedures and reasoning
Overarching Idea	Change and relationship
Context	Personal
Item Format	Short Answer
Cognitive process	Understanding
Proficiency Level	2

Description of Answer Key and Credits

Full credit: 02 Rs.360

Partial credit: no partial credit

No credit: 00 :other response / no response

<u>Domain: Mathematics literacy</u>	<u>Theme: POLYNOMIALS</u>	<u>Class: IX</u> <u>Expected time: 2minutes</u> <u>Total credit: 2</u>												
Description of Item <table border="1" data-bbox="193 409 592 640"> <tr><td>R</td><td>Text</td></tr> <tr><td>R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	R	Text	R	Image		Table		Graph		Map		Poem	Learning outcome: (as per NCERT) The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.	
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													



41.4 On the occasion of Diwali he offered an cash back offer 20% for the above mentioned items up to Rs50/. She will be charged -----Rupees

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Employing Mathematical Concepts, facts, porcedures and reasoning
Overarching Idea	Change and relationship
Context	Personal
Item Format	Short Answer
Cognitive process	Application
Proficiency Level	2

Description of Answer Key and Credits

Full credit: 02 Rs..340

Partial credit: no partial credit

No credit: 00 :other response / no response

<p><u>Domain: Mathematics literacy</u></p>	<p><u>Theme: POLYNOMIAL S</u></p>	<p><u>Class: IX</u> <u>Expected time: 2minutes</u> <u>Total credit: 2</u></p>												
<p>Description of Item</p> <table border="1"> <tr><td>R</td><td>Text</td></tr> <tr><td>R</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	R	Text	R	Image		Table		Graph		Map		Poem	<p>Learning outcome: (as per NCERT)</p> <p>The learner identifies or classifies polynomials among algebraic expressions and also factorises them by applying appropriate algebraic identities.</p>	
R	Text													
R	Image													
	Table													
	Graph													
	Map													
	Poem													



41.5 If gets 10% discount on each item during **Republic day – 2020** then she will be charged -----Rupees. Among all which is more beneficial?

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency cluster	Interpreting, applying and evaluating mathematical outcomes
Overarching Idea	Change and relationship
Context	Personal
Item Format	Short Answer
Cognitive process	Understanding
Proficiency Level	2

Description of Answer Key and Credits

Full credit: 02 Rs.351, Cash back of 20% up to Rs50

Partial credit: no partial credit

No credit: 00 :other response / no response

Template for preparation of Practice Items for Mathematical Literacy - Set – 1
Theme - 01

Domain: Mathematical Literacy	Theme: 01, Booking movie show Chapter : Co-ordinate Geometry	Class: IX Expected time: 10 min Total credit: 08
Description of Item		Learning Outcomes: Students will be able to use of Coordinate Plane, Identify Coordinate Points and visualizing object horizontally and vertically.
✓	Text	
✓	Image	
✓	Table	
	Graph	
	Map	
	poem	

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific / Societal
Item format	MCQ, short response
Cognitive process	Interpret and employ
Proficiency Level	6

Credit pattern:

Full Credit:02

Partial Credit: NA

Nil Credit:00

Description of answer key and Credits:

Q01. Full credit:: (d)
Nil credit: Other responses and missing

Q02. Full credit:: (a)
Nil credit: Other responses and missing

Q03. Full credit: (b)
Nil credit: Other responses and missing.

Q04. Full credit:Mandeep
Nil credit: Other responses and missing.

Name of the Teacher : Indu Yadav
Designation :TGT (Maths)
Email :ishnav.indu@gmail.com
Phone No. :9999637457
Name of the Vidyalaya : KVAGCR COLONY Shift I
KVS Region :Delhi

Template for preparation of Practice Items for Mathematical Literacy - Set – 1
Theme - 02

Domain: Mathematical Literacy	Theme: 02, <u>High rise buildings</u> Chapter : Co-ordinate Geometry	Class: IX Expected time: 10 min Total credit: 08
Description of Item		Learning Outcomes: Students will be able to use of Coordinate Plane, Identify Coordinate Points and visualizing object horizontally and vertically..
✓	Text	
✓	Image	
✓	Table	
✓	Graph	
	Map	
	poem	

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific / Societal
Item format	MCQ , open constructed response
Cognitive process	Interpret and employ
Proficiency Level	6

Credit pattern:

Full Credit:02

Partial Credit: NA

Nil Credit:00

Description of answer key and Credits:

Q01. Full credit:Q1 Full credit :- due to population increase people are not able to find open space .

Nil credit: Other responses and missing

Q2. Full credit :- (d)

Nil credit: Other responses and missing

Q3.Full credit :- (d)

Nil credit: Other responses and missing

Q4. Full credit :- Yes ,191 flats

Nil credit: Other responses and missing

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 KVS Region :Delhi

Template for preparation of Practice Items for Mathematical Literacy - Set – 1
Theme - 03

Domain: Mathematical Literacy	Theme: 03, 'Pariksha Pe Charcha-2020' Chapter : Co-ordinate Geometry	Class: IX Expected time: 5 min Total credit: 08
Description of Item		Learning Outcomes: Students will be able to Use of Coordinate Plane, Identify Coordinate Points and visualizing object horizontally and vertically.
✓	Text	
✓	Image	
✓	Table	
✓	Graph	
	Map	
	poem	

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific / Societal
Item format	MCQ , Open constructed response
Cognitive process	Interpret and employ
Proficiency Level	6

Credit pattern:

Full Credit:02

Partial Credit: 01

Nil Credit:00

Description of answer key and Credits:

Q01. Full credit: Students feel stress free , and get motivated that if PM can do the impossible, then why can't I.

Nil credit: Other irrelevant responses and missing
Q02. Full credit: :- Student gets motivated,

Parents become more supportive towards their wards,

Teacher are able to deal with students more technically, etc.

Partial credit: related responses

Nil credit: Missing or any other response.

Q03. Full credit: (c)

Nil credit: Other responses and missing.

Q04. Full credit: : (b)

Nil credit: Other responses and missing

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Template for preparation of Practice Items for Mathematical Literacy - Set – 1
Theme - 04

Domain: Mathematical Literacy	Theme: 04, <u>Mathematics in art</u> Chapter : Co-ordinate Geometry	Class: IX Expected time: 10 min Total credit: 08												
<table border="1" style="width: 100%;"> <tr> <td style="width: 15%;">✓</td> <td>Text</td> </tr> <tr> <td>✓</td> <td>Image</td> </tr> <tr> <td>✓</td> <td>Table</td> </tr> <tr> <td>✓</td> <td>Graph</td> </tr> <tr> <td></td> <td>Map</td> </tr> <tr> <td></td> <td>poem</td> </tr> </table>		✓	Text	✓	Image	✓	Table	✓	Graph		Map		poem	<p>Learning Outcomes:</p> <p>Students will be able to Use of Coordinate Plane, Identify Coordinate Points and visualizing object horizontally and vertically.</p>
✓	Text													
✓	Image													
✓	Table													
✓	Graph													
	Map													
	poem													

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific / Societal
Item format	MCQ, Short response
Cognitive process	Interpret and employ
Proficiency Level	6

Credit pattern:

Full Credit:02

Partial Credit: NA

Nil Credit:00

Description of answer key and Credits:

<p>Q01. Full credit: : (a) Nil credit: Other responses and missing</p> <p>Q02. Full credit: (3,6) and (7,1) Nil credit: Other responses and missing</p> <p>Q03. Full credit: Rectangle Nil credit: Other responses and missin</p> <p>Q04. Full credit: Window of the picture, Triangle Nil credit: Other responses and missing</p>
--

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Template for preparation of Practice Items for Mathematical Literacy - Set – 1
 Theme - 05

Domain: Mathematical Literacy	Theme: 05, Examination room Chapter : Co-ordinate Geometry	Class: IX Expected time: 5 min Total credit: 08
Description of Item	Learning Outcomes:	
✓ ✓ ✓ ✓	Students will be able to Use of Coordinate Plane, Identify Coordinate Points and visualizing object horizontally and vertically.	
	Text	
	Image	
	Table	
	Graph	
	Map	
	poem	

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific / Societal
Item format	MCQ, short response, open constructed response
Cognitive process	Interpret and employ
Proficiency Level	6

Credit pattern:

Full Credit:02

Partial Credit: NA

Nil Credit:00

Description of answer key and Credits:

Q01. Full credit: (a)

Nil credit: Other responses and missing.

Q02. Full credit: :Science Olympiad and Cyber Olympiad.

Nil credit: Other responses and missing..

Q03 Full credit: (a) 3rd row ,3rd column with English student Roll number 23.

Nil credit: Other responses and missing.

Q04. Full credit: Because Mathematics, Science ,English and Cyber are Global Subjects.
for other related responses.

Nil credit: Other not related responses and missing

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**Template for preparation of Practice Items for Mathematical Literacy - Set – 2
 Theme - 01**

Domain: Mathematical Literacy	Theme: 01, AIR TRAFFIC CONTROL Chapter : Co-ordinate Geometry	Class: IX Expected time: 5 min Total credit: 06
Description of Item		Learning Outcomes: 1. To Plot points in coordinate plane 2. To find distance between 2 points using observation. 3. To find coordinates of a given point
✓	Text	
✓	Image	
✓	Table	
✓	Graph	
	Map	
	poem	

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific
Item format	MCQ
Cognitive process	Interpretation
Proficiency Level	6

Credit pattern:

Full Credit:02

Partial Credit: NA

Nil Credit:00

Description of answer key and Credits:

Q01. Full credit: c) 3000km

Nil credit: Missing or any other response.

Q02. Full credit: b) (6,2500)

Nil credit: Missing or any other response.

Q03. Full credit: (b) 06:30 a.m.

Nil credit: Missing or any other response.

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Template for preparation of Practice Items for Mathematical Literacy - Set – 2
Theme – 02

Domain: Mathematical Literacy	Theme: DIAMOND ROBBERY Chapter : Co-ordinate Geometry	Class: IX Expected time: 5 min Total credit: 08												
Description of Item	Learning Outcomes:													
<table border="1"><tr><td>✓</td><td>Text</td></tr><tr><td></td><td>Image</td></tr><tr><td></td><td>Table</td></tr><tr><td>✓</td><td>Graph</td></tr><tr><td></td><td>Map</td></tr><tr><td></td><td>poem</td></tr></table>	✓	Text		Image		Table	✓	Graph		Map		poem	<ol style="list-style-type: none">1. To Plot points in coordinate plane2. To find distance between 2 points using observation.3. To find coordinates of a given point.	
✓	Text													
	Image													
	Table													
✓	Graph													
	Map													
	poem													

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific / Societal
Item format	COMPLEX MCQ
Cognitive process	Evaluate
Proficiency Level	6

Credit pattern:

Full Credit:02

Partial Credit: NA

Nil Credit:00

Description of answer key and Credits:

- | |
|---|
| Q01. Full credit: b) M is nearer to diamond
Nil credit: Missing or any other response. |
| Q02. Full credit: b) (3,4)
Nil credit: Missing or any other response. |
| Q03. Full credit: c) 5
Nil credit: Missing or any other response. |
| Q04. Full credit: c) Shyam
Nil credit: Missing or any other response. |

--

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Template for preparation of Practice Items for Mathematical Literacy - Set – 2 Theme – 03

Domain: Mathematical Literacy	Theme: PAINTINGS Chapter : Co-ordinate Geometry	Class: IX Expected time: 10 min Total credit: 10
Description of Item		Learning Outcomes: 1. To Plot points in coordinate plane 2. To find distance between 2 points using observation. 3. To find coordinates of a given point.
✓	Text	
	Image	
✓	Table	
✓	Graph	
	Map	
	poem	

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific / Societal
Item format	CLOSED CONSTRUCTED RESPONSE AND MCQ
Cognitive process	Interpret and evaluate
Proficiency Level	4

Credit pattern:

Full Credit:02

Partial Credit: 01

Nil Credit:00

Description of answer key and Credits:

<p>Q01. Full credit: (4.5,10) Partial credit: for finding mid- point of upper side of frame Nil credit: Missing or any other response.</p> <p>Q02. Full credit: c) 3 Nil credit: Missing or any other response.</p> <p>Q03. Full credit: a) 1 Nil credit: Missing or any other response.</p> <p>Q04. Full credit: d) 5 Nil credit: Missing or any other response.</p> <p>Q05: Full credit :3 units Nil credit : Missing or any other response.</p>
--

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Template for preparation of Practice Items for Mathematical Literacy - Set – 2 Theme – 04

Domain: Mathematical Literacy	Theme: TEMPERATURE Chapter : Co-ordinate Geometry	Class: IX Expected time: 5 min Total credit: 08												
<table border="1"> <tr><td>✓</td><td>Text</td></tr> <tr><td></td><td>Image</td></tr> <tr><td>✓</td><td>Table</td></tr> <tr><td>✓</td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>poem</td></tr> </table>	✓	Text		Image	✓	Table	✓	Graph		Map		poem	Learning Outcomes: 1. To plot points in coordinate plane 2. To find distance between 2 points using observation. 3. To find coordinates of a given point.	
✓	Text													
	Image													
✓	Table													
✓	Graph													
	Map													
	poem													

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific / Societal
Item format	MCQ , Short response
Cognitive process	Interpret and employ
Proficiency Level	4

Credit pattern:

Full Credit:02

Partial Credit: 01

Nil Credit:00

Description of answer key and Credits:

Q01. Full credit: d) IV Nil credit: Missing or any other response.
Q02. Full credit: c) 6 degrees celsius Nil credit: Missing or any other response.
Q03. Full credit: c) 9m Nil credit: Missing or any other response.
Q04. Full credit: global warming ,melting of ice Partial credit : any other drawbacks of increase in temperature Nil credit: Missing or any other response.

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Template for preparation of Practice Items for Mathematical Literacy - Set – 2
Theme – 05

Domain: Mathematical Literacy	Theme: TRAFFIC PROBLEM Chapter : Co-ordinate Geometry	Class: IX Expected time: 7 min Total credit: 08														
<table border="1"> <tr> <th colspan="2">Description of Item</th> </tr> <tr> <td style="text-align: center;">✓</td> <td>Text</td> </tr> <tr> <td></td> <td>Image</td> </tr> <tr> <td></td> <td>Table</td> </tr> <tr> <td style="text-align: center;">✓</td> <td>Graph</td> </tr> <tr> <td></td> <td>Map</td> </tr> <tr> <td></td> <td>poem</td> </tr> </table>		Description of Item		✓	Text		Image		Table	✓	Graph		Map		poem	Learning Outcomes: 1. To plot points in coordinate plane 2. To find distance between 2 points using observation. 3. To find coordinates of a given point.
Description of Item																
✓	Text															
	Image															
	Table															
✓	Graph															
	Map															
	poem															

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific / Societal
Item format	Short response item,open constructed response, MCQ
Cognitive process	Formulate
Proficiency Level	5

Credit pattern:

Full Credit:02

Partial Credit: 01

Nil Credit:00

Description of answer key and Credits:

Q01. Full credit: c) (-2,21)

Nil credit: Missing or any other response.

Q02. Full credit: 22 min

Nil credit: Missing or any other response.

Q03. Full credit: b) 8 min

Nil credit: Missing or any other response.

Q04. Full credit: increase in commute time on road will increase the traffic on roads and increase in pollution level.

Partial credit : it will cause health problems due to pollution.

Nil credit: Missing or any other response.

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Template for preparation of Practice Items for Mathematics Literacy - Set – 3 Theme - 01

Domain: Mathematical Literacy	Theme: 01, PROJECT TIGER Chapter : Co-ordinate Geometry	Class: IX Expected time: 4 min Total credit: 08												
Description of Item	Learning Outcomes:													
<table border="1"><tr><td>✓</td><td>Text</td></tr><tr><td>✓</td><td>Image</td></tr><tr><td>✓</td><td>Table</td></tr><tr><td>✓</td><td>Graph</td></tr><tr><td></td><td>Map</td></tr><tr><td></td><td>poem</td></tr></table>	✓	Text	✓	Image	✓	Table	✓	Graph		Map		poem	Students will be able to Use of Coordinate Plane, Identify Coordinate Points and Calculate distance between points opposite to coordinate axis.	
✓	Text													
✓	Image													
✓	Table													
✓	Graph													
	Map													
	poem													

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific / Societal
Item format	MCQ ,short response
Cognitive process	Interpret and employ
Proficiency Level	6

Credit pattern:

Full Credit:02

Partial Credit:NA

Nil Credit:00

Description of answer key and Credits:

Q01. Full credit: b) (-6,-4)

Nil credit: Missing or any other response.

Q02. Full credit: c) (3,0)

Nil credit: Missing or any other response.

Q03. Full credit: Point C, Group 1

Nil credit: Missing or any other response.

Q04. Full credit: a) (6, 2)

Nil credit: Missing or any other response.

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Template for preparation of Practice Items for Mathematics Literacy - Set – 3
Theme - 02

Domain: Mathematical Literacy	Theme: 02, PLOG RUN Chapter : Co-ordinate Geometry	Class: IX Expected time: 4 min Total credit: 08
Description of Item	Learning Outcomes:	
<input checked="" type="checkbox"/> Text	Students will be able to Use of Coordinate Plane, Identify Coordinate Points and Calculate distance between points opposite to coordinate axis.	
<input checked="" type="checkbox"/> Image		
<input checked="" type="checkbox"/> Table		
<input checked="" type="checkbox"/> Graph		
Map		
poem		

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific / Societal
Item format	Short response, MCQ
Cognitive process	Interpret and employ
Proficiency Level	4

Credit pattern:

Full Credit:02

Partial Credit:NA

Nil Credit:00

Description of answer key and Credits:

Q01. Full credit: b) B(5,1) F(4,5)
Nil credit: Missing or any other response.
Q02. Full credit: 1350 m or 1.35km
Nil credit: Missing or any other response.
Q03. Full credit: (-5, -4)
Nil credit: Missing or any other response.
Q04. Full credit: 10500m or 10.5km
Nil credit: Missing or any other response.

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KVS REGION : Delhi

Template for preparation of Practice Items for Mathematics Literacy - Set – 3
Theme - 03

Domain: Mathematical Literacy	Theme: 03, PAINTING Chapter : Co-ordinate Geometry	Class: IX Expected time: 4 min Total credit: 08
Description of Item	Learning Outcomes:	
✓	Text	Students will be able to Use of Coordinate Plane, Identify Coordinate Points and Calculate distance between points opposite to coordinate axis.
✓	Image	
✓	Table	
✓	Graph	
	Map	
	poem	

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific
Item format	Short response
Cognitive process	Interpret and employ
Proficiency Level	6

Credit pattern:

Full Credit:02

Partial Credit:NA

Nil Credit:00

Description of answer key and Credits:

Q01. Full credit: (4, 8)

Nil credit: Missing or any other response.

Q02. Full credit: (7, 2)

Nil credit: Missing or any other response.

Q03. Full credit: 36 sq. inch

Nil credit: Missing or any other response.

Q04. Full credit: (13, 8) & (13, 2)

Nil credit: Missing or any other response.

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Template for preparation of Practice Items for Mathematics Literacy - Set – 3
Theme -4

Domain: Mathematical Literacy	Theme: 04, FARMER Chapter : Co-ordinate Geometry	Class: IX Expected time:5 min Total credit: 08												
Description of Item	Learning Outcomes:													
<table border="1"><tr><td>✓</td><td>Text</td></tr><tr><td>✓</td><td>Image</td></tr><tr><td>✓</td><td>Table</td></tr><tr><td>✓</td><td>Graph</td></tr><tr><td></td><td>Map</td></tr><tr><td></td><td>poem</td></tr></table>	✓	Text	✓	Image	✓	Table	✓	Graph		Map		poem	Students will be able to Use of Coordinate Plane, Identify Coordinate Points and Calculate distance between points opposite to coordinate axis.	
✓	Text													
✓	Image													
✓	Table													
✓	Graph													
	Map													
	poem													

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific / Societal
Item format	Short response
Cognitive process	Interpret and employ
Proficiency Level	6

Credit pattern:

Full Credit:02

Partial Credit:NA

Nil Credit:00

Description of answer key and Credits:

Q01. Full credit: A (-1, 3), B (-1, -1), F (-7, -1), E (-7, 3)

Nil credit: Missing or any other response.

Q02. Full credit: (1, 1)

Nil credit: Missing or any other response.

Q03. Full credit: Area of field = 3750m² Yield of Wheat = 1264.125 kg

Nil credit: Missing or any other response.

Q04. Full credit: Earning = 23259.90 Rupees

Nil credit: Missing or any other response.

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Template for preparation of Practice Items for Mathematics Literacy - Set – 3
Theme -5

Domain: Mathematical Literacy	Theme: 05, PIZZA DELIVERY Chapter : Co-ordinate Geometry	Class: IX Expected time: 5 min Total credit: 08
Description of Item	Learning Outcomes:	
<input checked="" type="checkbox"/> Text	Students will be able to Use of Coordinate Plane, Identify Coordinate Points and Calculate distance between points opposite to coordinate axis.	
<input checked="" type="checkbox"/> Image		
<input checked="" type="checkbox"/> Table		
<input checked="" type="checkbox"/> Graph		
<input type="checkbox"/> Map		
<input type="checkbox"/> poem		

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching idea	Change and relationships
Context	Scientific
Item format	Short response
Cognitive process	Interpret and employ

Proficiency Level	6
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Credit pattern:

Full Credit:02

Partial Credit: NA

Nil Credit: 00

Description of answer key and Credits:

Q01. Full credit: (-3, -3)

Nil credit: Missing or any other response.

Q02. Full credit: 3000m or 3 km

Nil credit: Missing or any other response.

Q03. Full credit: Between 1.59 pm & 2.00pm

Nil credit: Missing or any other response.

Q04. Full credit: 12 km

Nil credit: Missing or any other response.

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CRITICAL AND CREATIVE THINKING ITEMS

CLASS IX : CHAPTER 3 : COORDINATE GEOMETRY

INDEX

S.No.	Theme of the item
35.	Booking movie show
36.	High right building
37.	'Pariksha pe charcha-2020'
38.	Mathematics in art
39.	Examination room
40.	Air traffic control
41.	Diamond robbery
42.	Paintings
43.	Temperature
44.	Traffic problem
45.	Project tiger
46.	Plog run
47.	Painting
48.	Farmer
49.	Pizza delivery

Theme 1

BOOKING MOVIE SHOW



Mandeep family has planned for a movie show for the week end. They booked the tickets for four members of the family, the seats in the cinema hall are as follows.

A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
B10	B9	B8	B7	B6	B5	B4	B3	B2	B1
C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
D10	D9	D8	D7	D6	D5	D4	D3	D2	D1
E1	E2	E3	E4	E5	E6	E7	E8	E9	E10
F10	F9	F8	F7	F6	F5	F4	F3	F2	F1
G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
H10	H9	H8	H7	H6	H5	H4	H3	H2	H1
I1	I2	I3	I4	I5	I6	I7	I8	I9	I10
J10	J9	J8	J7	J6	J5	J4	J3	J2	J1

Due to weekend they are not able to get all the four seats together. They were offered seats C1,C2 and with this they were offered either D1,D2 or B1,B2 or D9,D10 .

Q1. Which is the most suitable seats with seats C1,C2

(a) D1,D2 (b) B1,B2 (c) C9,C10 (d) D10,D9

Q2.If Simran, Mandeep's sister is sitting on seaton C1, find the row and column for her from top-

(a)Row3,Column1 (b) Row1,Column1 (c)Row3,Column3 (d)Row1,Column3

Q3.Mandeep is sitting on seat C2, during intermission Sukdev, Mandeep's friend came to him and tells him that he is on seat three rows behind him and in the same column what is Sukhdev's seat number?

(a)D6 (b)G2 (c)C5 (d)A2

Q4. If the exit Gates are near A1 and J10,who will reach the exit gate first, Mandeep or Sukhdev.

Theme2

HIGH RISE BUILDINGS



Rekha's mother is planning to book a flat in Gaur City having 10 towers. Towers 1,3 and 5 are having 18 floors, Towers 2,4 and 6 are having 19 floors and remaining towers are having 20 floors.

As Rekha's grandmother is having problem in knees so they prefer to book the flat in lower floors but Rekha advices that when the builder is providing lift, then why can't we book flats in higher floor. In this tussle they compromised for 5th floor.

(i) Builder offer 5th floor only in towers having maximum floors.

(ii) Below 5th floor in tower with 18 floors.

(iii) And above 5th floor in remaining towers.

Q1. Can you think of some reasons for people shifting in highrises.

Q2. Out of the following combinations, which combinations is not suitable for Rekha's family

(a) Tower 10, 5th floor (b) Tower 8, 5th floor (c) Tower 7, 5th floor (d) Tower 5, 5th floor

Q3. If the towers are given alphabetical orders i.e, Tower 1 as A Tower, Tower 2 as B Tower and so on... and address of the flats are given like A5 for first tower 5th floor D7 for fourth tower and 7th floor which of the following is possible address for Rekha's flat.

(a) B5 (b) E5 (c) K5 (d) H5

Q4. If there is only one flat on one floor, can you find the total number of flats in Gaur City. If yes how many flats are there?

21																			
11																			20
1	2	3																	10

11																			20
1	2	3																	10

Q1.What is the effect of interaction with PM for the students who are actually in stress during exam days?

Q2.What are the benefits of the programme and how it improves the result?

Q3.Find the class and the roll number of the students sitting in senior wing has a seat which is mirror image of seat of student of class 8 roll number 12(all the students are sitting according to their roll numbers).

(a)(XI,9) (b) (XI,2) (c) (XI,19) (d) None of the these.

Q4.If a Student of class IX roll number 15 is absent can you imagine the mirror image of the seat in Junior Wing?

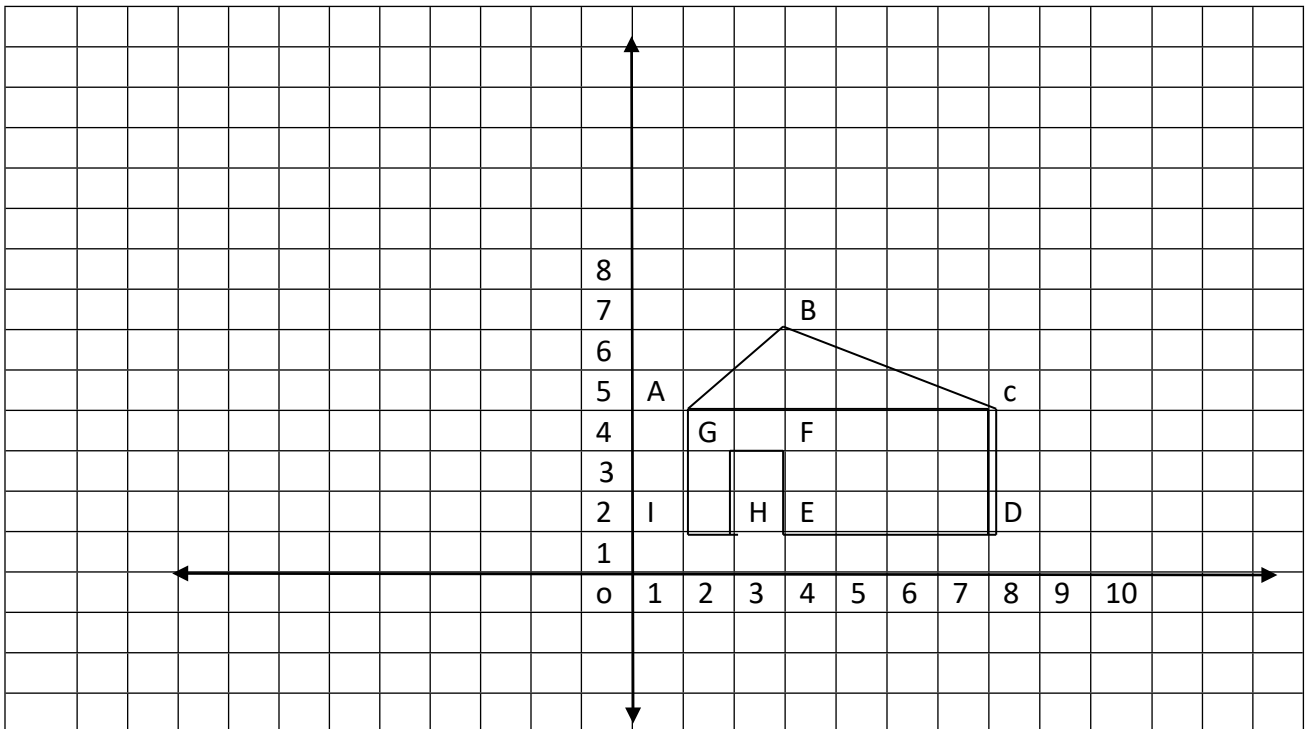
(a)(IX,15) (b) (VI,16) (c) (VI,15) (d) (IX,16)

Theme 4

MATHEMATICS IN ART



Mrs.Sylvia Das, an Art teacher , observes that these days, students are taking too much interest in Mathematics,and are least interested in Art Education ,so she innovates a method to use mathematics in art.



Q1 Art teacher is trying to interlink her subject with other subject .Why she is trying to do this?

- (a) to make her subject interesting
- (b) she is planning to change her subject

(c) mathematics is very important subject.

(d) her favourite subject is mathematics

Q2. What are the coordinates of point B and point D.

Q3. What shape you will get by joining the points $L(5,2)$, $M(7,2)$, $N(7,3)$, $P(5,3)$ in order.

Q4. What is the name you can give to the shape obtained in part 3, also identify the shape formed by points ABC.

Theme 5

EXAMINATION ROOM



To Have fair results in a competitive examination, 60 candidates of four different fields are made to sit in the examination hall.

The fields are – Science Olympiad, Maths Olympiad, English Olympiad and Cyber Olympiad Roll number of science and Maths Olympiad Students are from 1 to 15, and roll number of English and Cyber olympiad is from 16 to 30 .The hall in which these students sit is having 5 columns and 6 rows. Sitting plan is to be done from top left as follows--

Eng Math	Sci Cyber	Eng Math	Sci Cyber	Eng Math
Sci Cyber	Eng Math	Sci Cyber	Eng Math	Sci Cyber
Eng Math	Sci Cyber	Eng Math	Sci Cyber	Eng Math
Sci Cyber	Eng Math	Sci Cyber	Eng Math	Sci Cyber
Eng Math	Sci Cyber	Eng Math	Sci Cyber	Eng Math
Sci Cyber	Eng Math	Sci Cyber	Eng Math	Sci Cyber

Q1. What is the use of conducting such competitions when the students are having their regular class examinations. Select the option which is not suitable.

- (a) For the collection of money, as they charge a huge amount for registration.
- (b) For the search of talent
- (c) For encouraging students to take interest in those topics also which are not in their academic syllabus.
- (d) To inculcate creative and critical thinking among students.

Q2. Students of which subjects are sitting 3rd row and 2nd column?

Q3. Maths student roll number 8 is sitting in which row and column and with whom?

Q4. Why Olympiads are held for subjects like Maths, Science English and Cyber etc. and not for Hindi, Sanskrit, Environmental Studies e.t.c., for school students

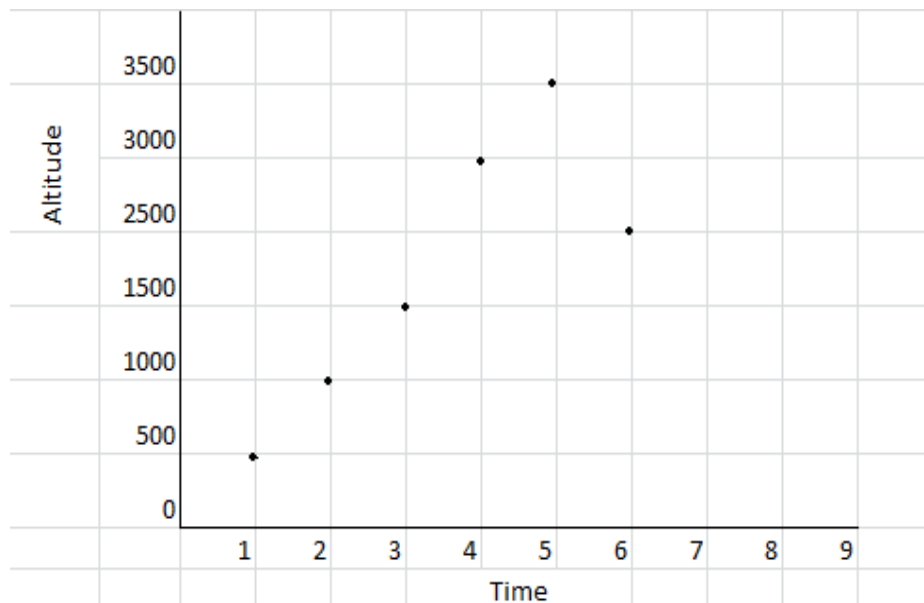
Theme 1

AIR TRAFFIC CONTROL

All the air traffic is controlled by air traffic controller. A Controller must know the location of every aircraft at any particular instant of time in the sky. Coordinates of any particular vehicle are used to describe its current location of the aircraft. Even if an aircraft moves a small distance (up, down, forward or backward), Its coordinates are updated in the system



If x axis represents the time (in hours) and y axis represents the altitude (in Km) then answer the questions (if 1 on x axis represent 6:00 am and 1 unit is 15 mins)



Q1. What is the altitude at 6:45 am.

- (a) 500 km (b) 1000 km (c) 3000 km (d) 3500 km

Q2. What are the coordinates at 7:15 am?

- (a) (25,6) (b) (6,2500) (c) (4,3000) (d) (3500,5)

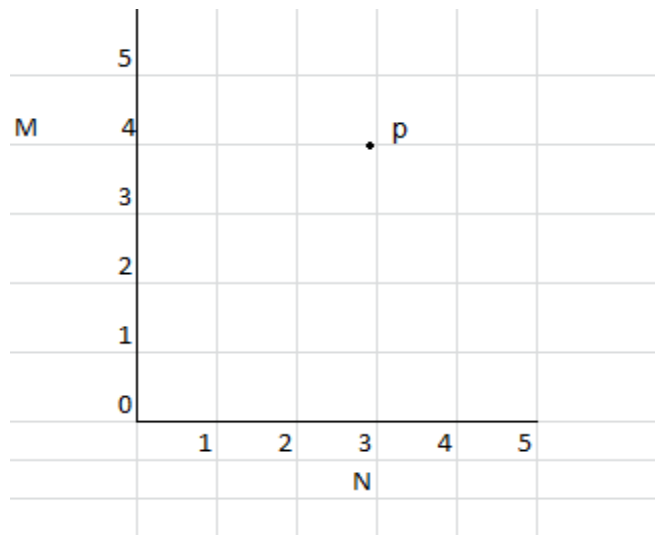
Q3. At what time, the altitude is 1500 Km.

- (a) 6:00 a.m. (b) 6:30 a.m. (c) 7:00 a.m. (d) 6:45 a.m.

Theme – 2

DIAMOND ROBBERY

A precious diamond is placed in an exhibition. There is tight security all around it. Two thieves Babloo and Shyam are trying to steal it. They are unaware about the presence of each other. Babloo is hiding at point N(3,0) and Shyam is hiding at point M(0,4) and the diamond is placed at point P. Both of them are also unaware about the policeman on duty at point O. Based on their locations, give answers.



Q1. Which of the following is true?

- (a) N is nearer to diamond.
- (b) M is nearer to diamond.
- (c) No one is nearer to diamond.
- (d) Both are at same distance from box.

Q2. What are the coordinates of the diamond.

- (a) (2,3)
- (b) (3,4)
- (c) (4,3)
- (d) None of these

Q3. What will be the shortest distance travelled by policeman to the diamond?

- (a) 7
- (b) 12
- (c) 5
- (d) None of these

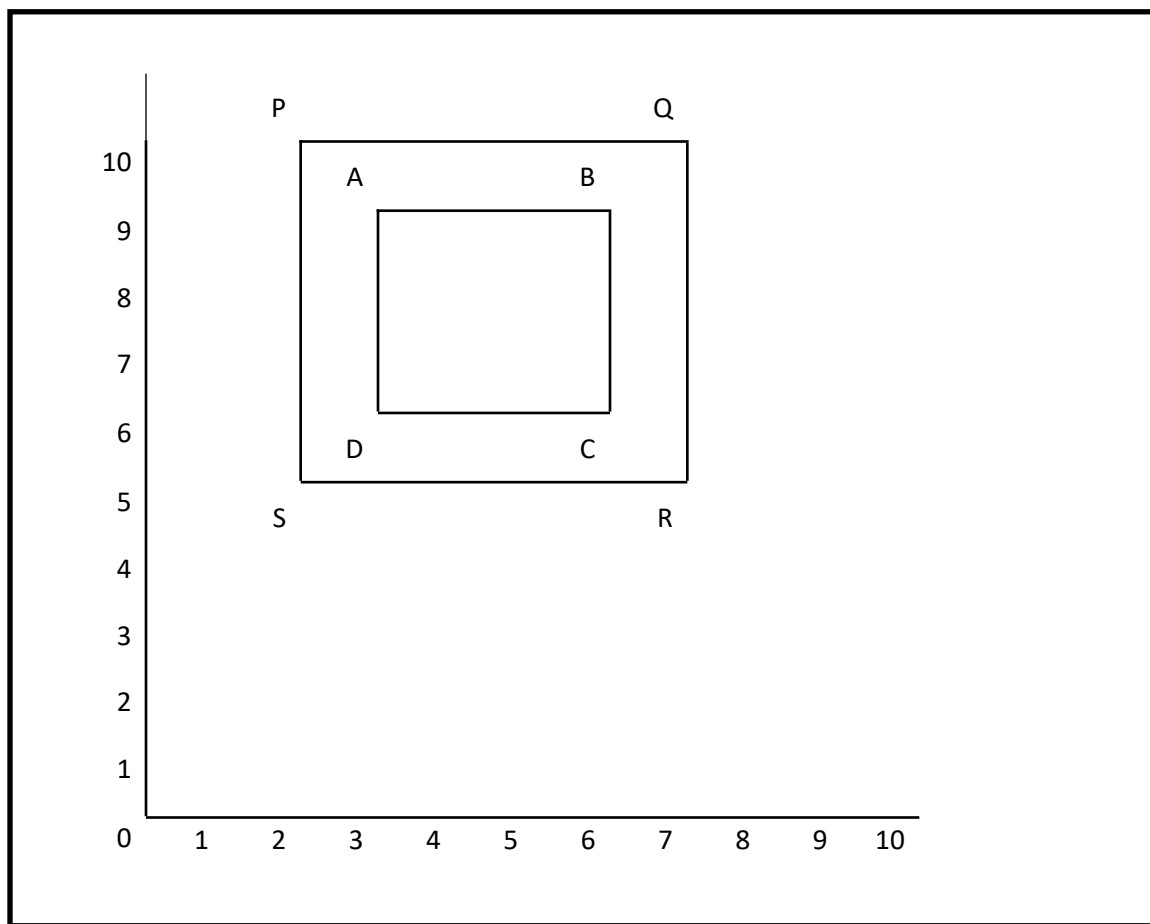
Q4. If it takes 1 min by policeman to cover one unit, 1.5 min by Babloo to cover one unit and 1.25 min by shyam to cover 1 unit, who will take least time to reach the diamond if started simultaneously.

- (a) Policeman

- (b) Babloo
- (c) Shyam
- (d) All together

Theme – 3 PAINTINGS

Annu is putting up one of her paintings in her living room. Suppose there were a grid on the wall where each unit measures a foot. The painting is represented by the inner square and frame is represented by outer square.



Q1. Maya places a nail so that it lies halfway across the top of the frame. Write the coordinate of point.....

Q2. Write the abscissa of upper left corner of painting.

- (a) 9 (b) 5 (c) 3 (d) 6

Q3. What is the width of frame outside painting.

- (a) 1 (b) 2 (c) 10 (d) 6

Q4. What is the ordinate lower right corner of frame?

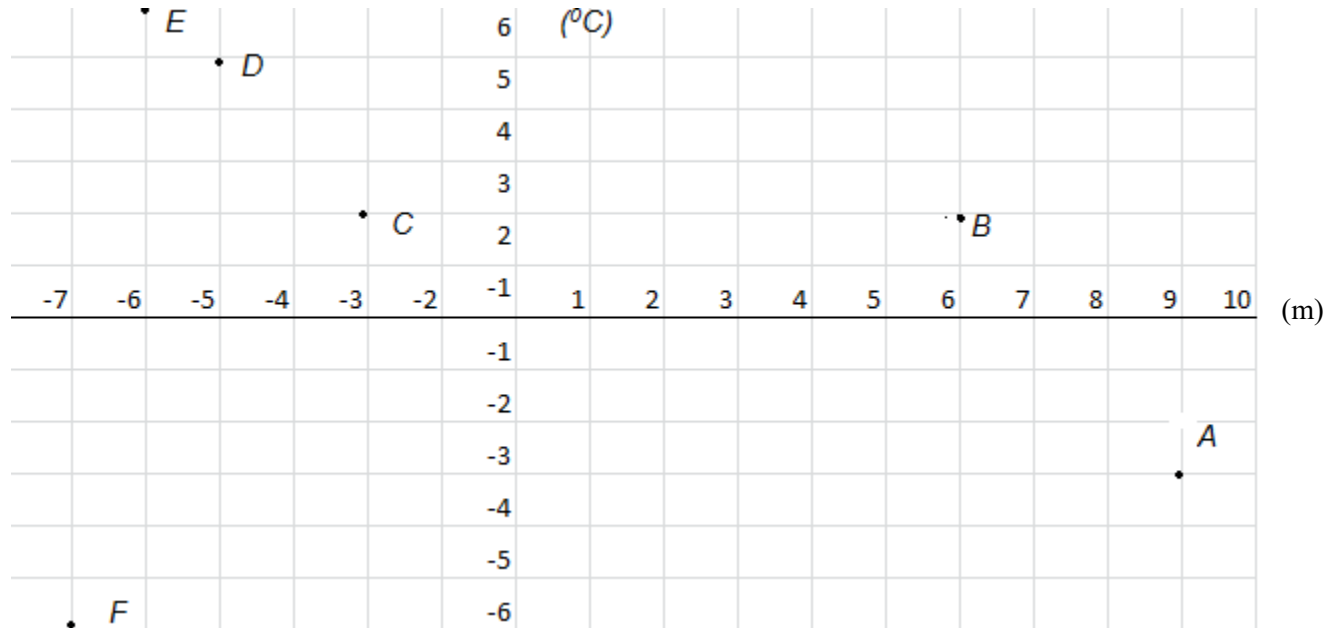
- (a) 2 (b) 3 (c) 6 (d) 5

Q5. What is the length of each side of painting?

.....

Theme – 4
TEMPERATURE

Ram graphed the relationship between temperature and elevation (height above the sea level) for several cities. The x-coordinate is the elevation in meters and y-coordinate is the temperature in degree Celsius.



Q1. Which quadrant would contain a point showing a city 6m above sea level and 9°C below zero.

- (a) I (b) II (c) III (d) IV

Q2. What was the temperature in city with an elevation of -6m?

- (a) -7° C (b) 2° C (c) 6° C (d) -2° C

Q3. What was the elevation when temperature was - 3° C ?

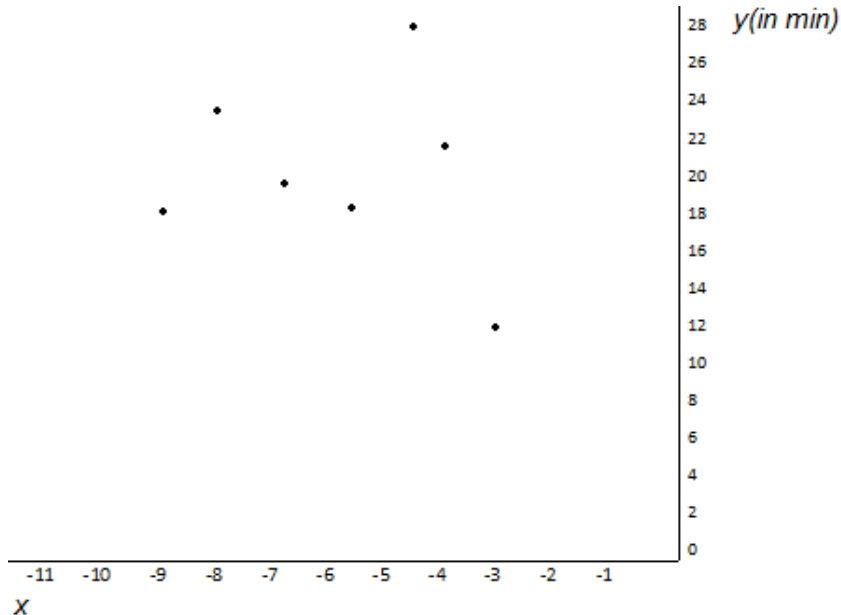
- (a) 2m (b) -2m (c) 9m (d) -9m

Q4. What is the effect of average increase in temperature on the earth?

.....

TRAFFIC PROBLEM

Ravi's office was 15 Km from his home. Ravi tracks his commute time. The coordinate plane below shows some of his commute time in the last two weeks. The x-axis of graph represents the numbers of days before today. -1 represents yesterday. The y-axis represents the commute time in minutes.



Q1. 2 days ago Ravi's commute time was halfway between his commute time 8 and 9 days ago. At what coordinate Ravi should graph his commute time 2 days ago.

- (a) (-2,22) (b)(20,-2) (c)(-2,21) (d) (-2,20)

Q2.How much time he took 4 days ago_____

Q 3 .By looking at the data what is the range of his commute time for 3 days ago and 7 days ago.

- (a) 12 (b) 8 (c) 22 (d) 17

Q4. What is effect of increased commute time on road for the commuting crowd?

.....

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Theme - 1

PROJECT TIGER

One of the most successful wildlife conservation ventures 'Project Tiger' which was initiated way back in 1972, has not only contributed to the conservation of tigers but also of the entire ecosystem. This project is sponsored by Ministry of Environment Forest and Climate Change. About 47 tiger reserves situated in more than 17 regions including Corbett National Park and Ranthambore National Park are part of this project which conducts assessments of number of tigers, their habitat, hunting habits under the supervision of the Tiger Task Force. Project Tiger has seen significant success in recovery of the habitat and increase in the population of the tigers in the reserve areas, from a scanty 268 in 9 reserves in 1972 to above 1000 in 28 reserves in 2006 to 2000+ tigers in 2016.

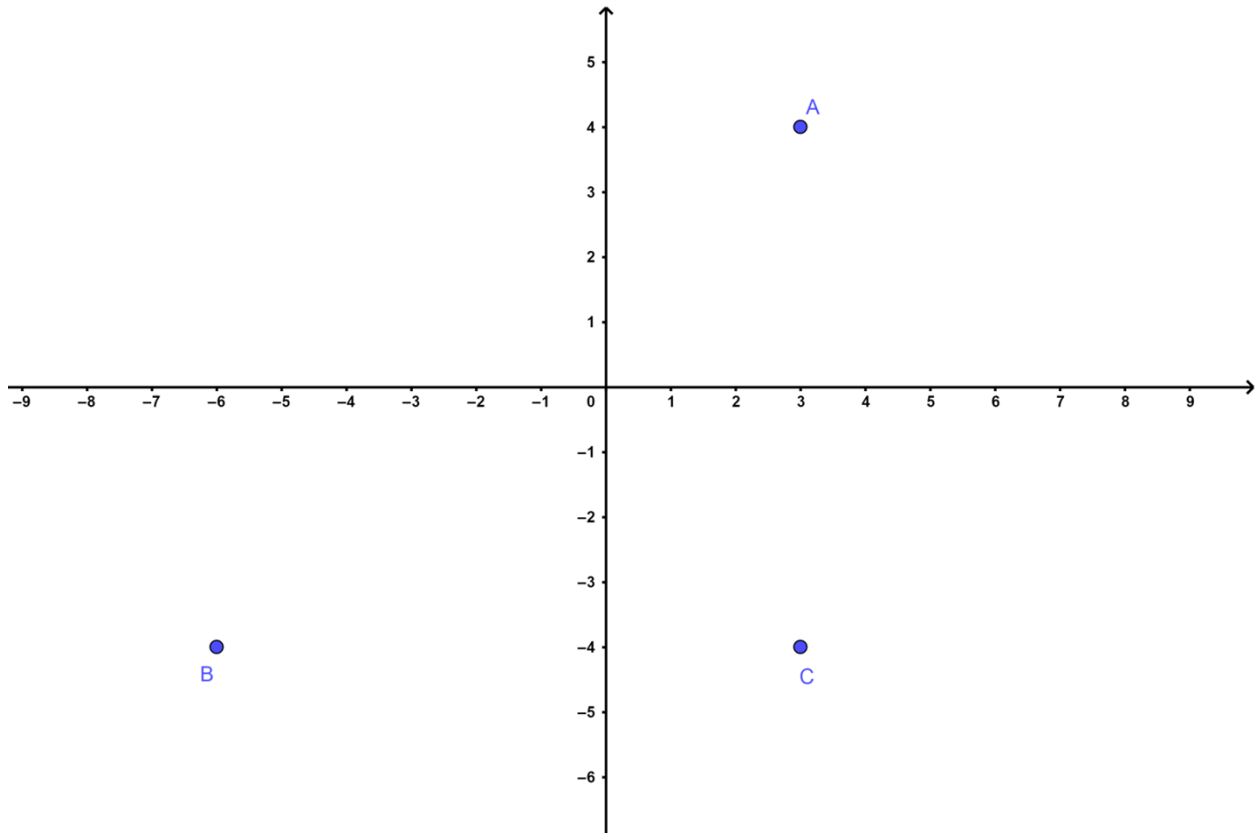
Ranthambore National Park introduced protection for tigers from hunters in 1973 and is now one of the best tiger reserves in India. One of the most interesting features of the park is that it's dotted with ancient ruins, including a fort where tigers and leopards are often spotted. Apart from tigers, the park is home to leopards, jungle cats, sloth bears, hyenas, Indian foxes, jackals and crocodiles. The greatest chances of spotting a tiger are in April and May.

The foot print of the tiger is important. It is considered that each pug mark is unique in itself & by analyzing various foot prints in the areas of tigers, the number of tigers in that area can be counted. GPS collar is used track few tigers.



**Wildlife Conservation Initiatives by
Indian Government**

A trip to Ranthambore National Park was organized by Kendriya Vidyalaya NFC Vigyan Vihar. The area of the park is divided into four quadrants of the coordinate plane.



Question 1:

From control room i.e. point A, of the co-ordinate plane, a tiger is located at point B. What are the coordinates of Tiger?

- a) (4, 3)
- b) (-6,-4)
- c) (-4, 3)
- d) (3, -4)

Question 2:

The location of the tiger is reported as the midpoint of the line segment joining Control room A and Students location C. What is the location of tiger now?

- a) (0, 3)
- b) (0, 0)
- c) (3, 0)
- d) 1, 3)

Question 3:

Another student group is at point E(-2,0). Which student group (Point) is nearer to the recent most position of the tiger?

Question 4:

Tiger, now, has moved 3 points towards East and 2 points towards North? What is the new location of Tiger?

- a) (6, 2)
- b) (6, -2)
- c) (0, 2)
- d) (0, -2)

Theme - 2

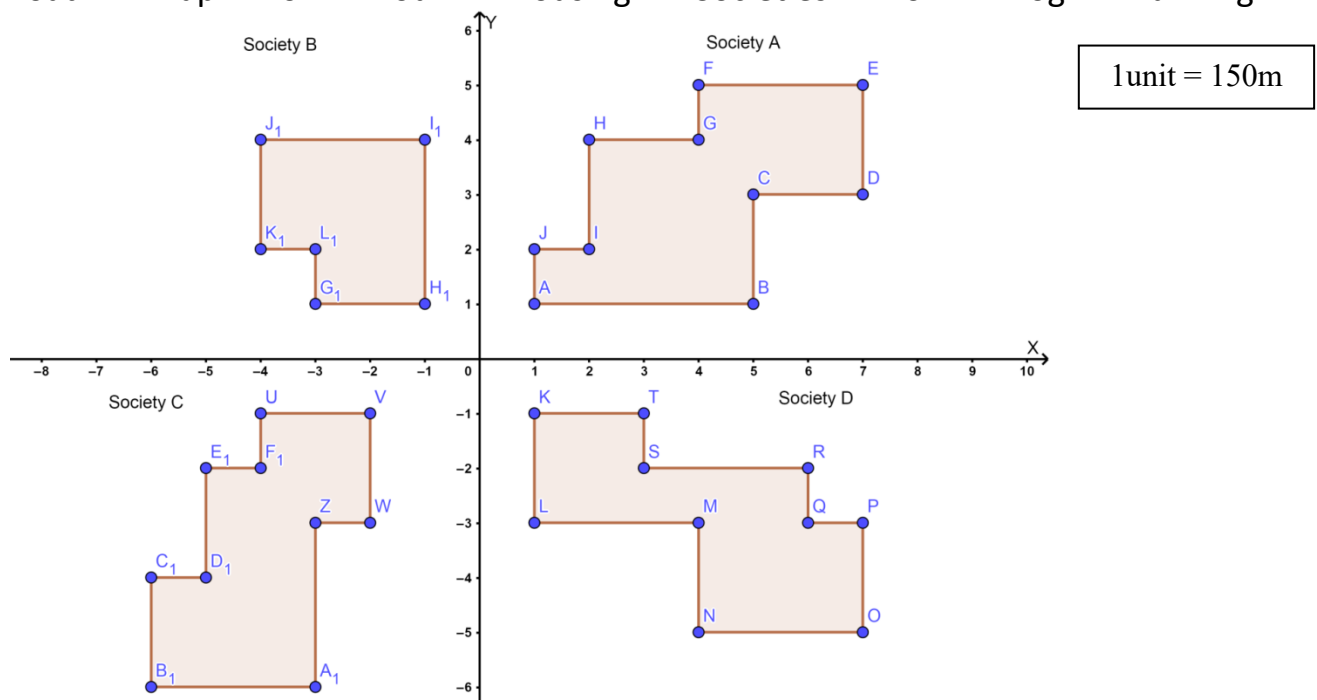
PLOG RUN

Plastic pollution is now considered a major threat to the earth's environment. Plastic waste and microplastics are a serious danger to the ocean habitats, the natural world and even our own health. Most of the plastic comes originally from the land. To control this, the Swedish phenomenon of "plogging" where joggers combine their run with picking up the trash they find in nature is going global.

To mark the 150th birth anniversary celebration of Mahatma Gandhi, Kendriya Vidyalaya Sangathan organized "FIT INDIA PLOG RUN" on 2nd October 2019 in all its schools across India. More than 45000 teachers, 500000 students and 125000 parents participated in the plog run.

Students of Class-IX of Kendriya Vidyalaya NFC Vigyan Vihar were allotted four housing society. Two cross roads perpendicular each other divides these four housing societies. They have to plog run along the roads of the society. Four groups naming Group 1, Group 2, Group 3, Group 4 of 2 students each, were formed. The map of roads of four housing societies is shown as coordinate plane.

Road Map of Four Housing Societies for Plog Running



Group 1, Group 2, Group 3 and Group 4 were allotted Society D, Society C, Society B, Society A respectively.

Question 1:

Both the students of group 4 decided to start from point B and will meet each other at point F. One student took the path BCDEF and other student took BAIHGF route.

The coordinates of B and F are –

- a) B(5,1) F(5,4)
- b) B(5,1) F(4,5)
- c) B(1,5) F(4,5)
- d) B(1,5) F(5,4)

Question 2:

Find the distance covered by the student who took the path BCDEF?

Question 3:

Both the students of group 2 decided to start from point V and will meet each other at point B₁. One student took the path VWZA₁B₁ and other student took VUF₁E₁D₁C₁B₁ route.

At point D₁, the student got injured while plog run and some vehicle was arranged to pick him up. What are the coordinates where the student got injured?

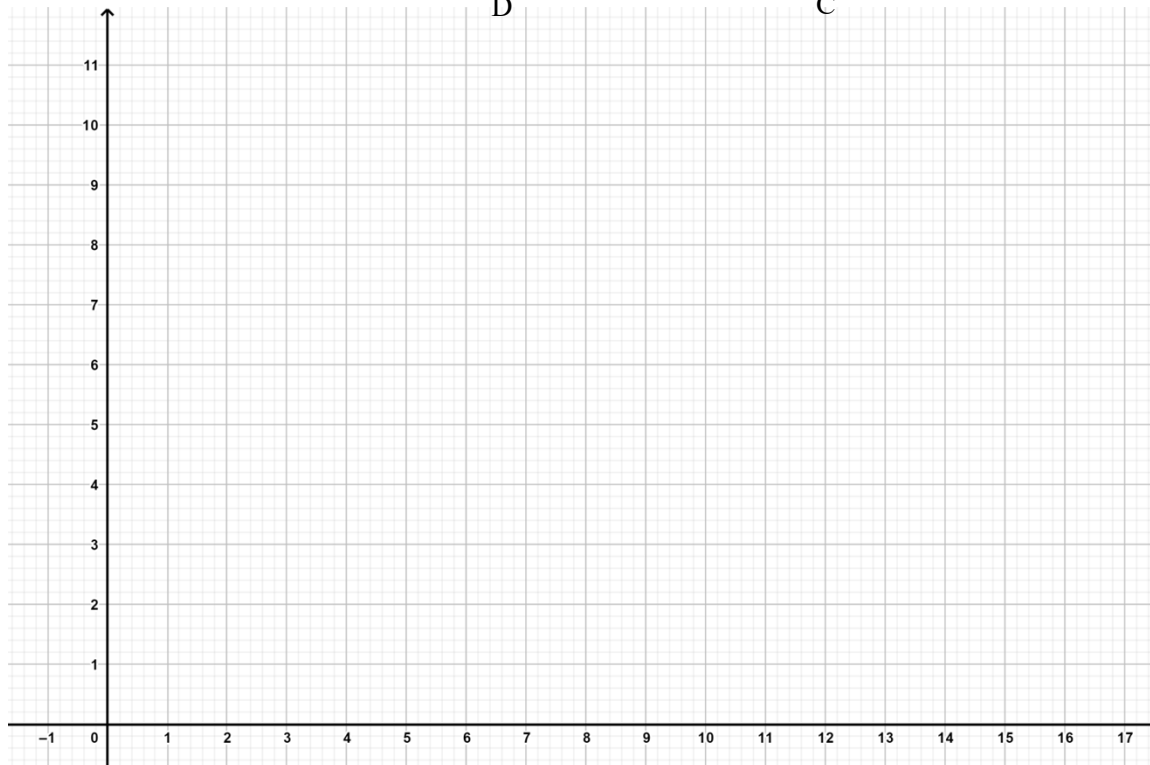
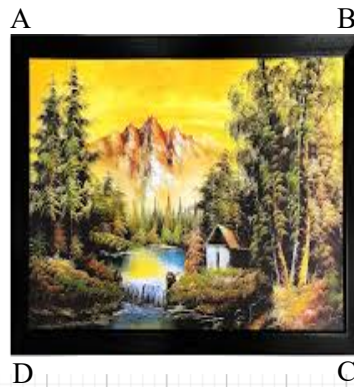
Question 4:

What is the total distance (in km) covered by all the groups?

Theme - 3

PAINTING

Seema is a painter. She has exhibited many paintings. She is putting up one of her painting in her living room. Suppose there is a grid on the wall where each unit measures an inch. The painting in the frame is represented by the inner square and the frame is represented by the outer square. Seema places a nail so that it lies half way across the top of the frame.



Question 1:

If upper left corner of frame is at $(1,8)$ and upper right corner of frame at $(7,8)$. What will be the coordinate of the nail placed by Seema.

Question 2:

Seema's friend Meera said that the bottom left corner of your frame is at $(1,2)$. What will be the coordinate of bottom right corner?

Question 3:

Seema wants her painting to be safe and free from dust. So she covered it while going for vacations. What will be the area of paper used while covering the painting?

Question 4:

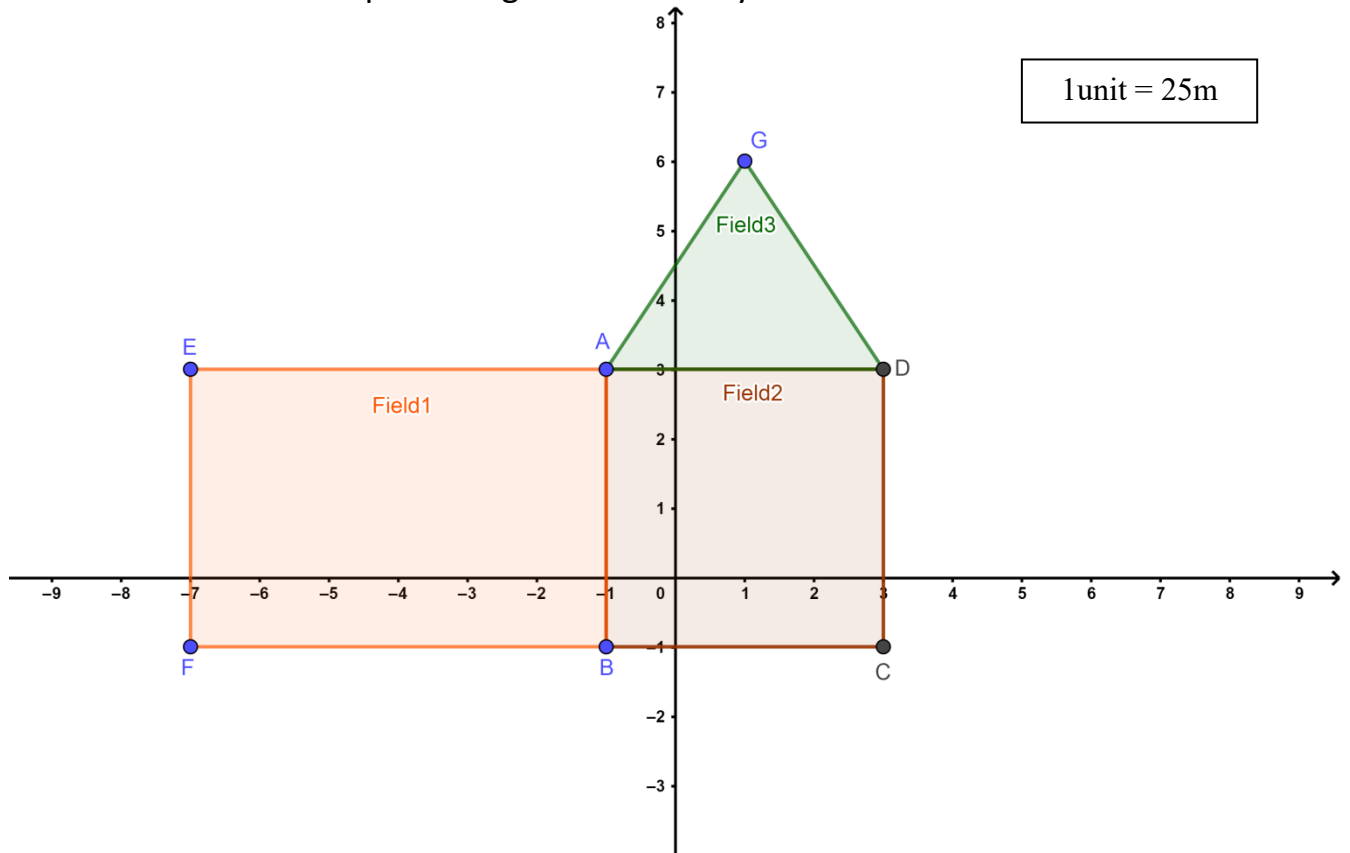
If a mirror is placed along with the side BC of frame, what will be the coordinates of B and C as seen in the reflection?

Theme 4

FARMER

A farmer Naresh has the field AGDCFE as shown in the map. He decided to grow three crops in his field. Naresh divided his field into three fields for each crop. There is shortage of onions in the country and he decided to grow onions on the field which has more area. In the field having smallest area he decided to grow wheat and in remaining field he decided to grow tomatoes.

Map showing field owned by a Naresh FARMER



Question 1:

What are the coordinates of field in which onion is grown?

Question 2:

Naresh needs to water the fields of onion and tomatoes with a sprinkler. He decides to place sprinkler in the middle of each field. Write the coordinates where Naresh will put sprinkler in the field of tomato.

Question 3:

Annual yield of wheat in India in FY 2018 is 3,371 kilograms per hectare.

What is expected yield of wheat in Naresh field?

Question 4:

The revised purchase price of wheat is 1,840 rupees (\$25.09) per 100 kg for 2019 compared with 1,735 rupees a year ago, Farm Minister Radha Mohan Singh said. India, the world's second-biggest rice and wheat producer, buys the grain from local farmers at state-set prices to build stocks to run a major food welfare programme.

How much earning is expected by Naresh?

Theme 5

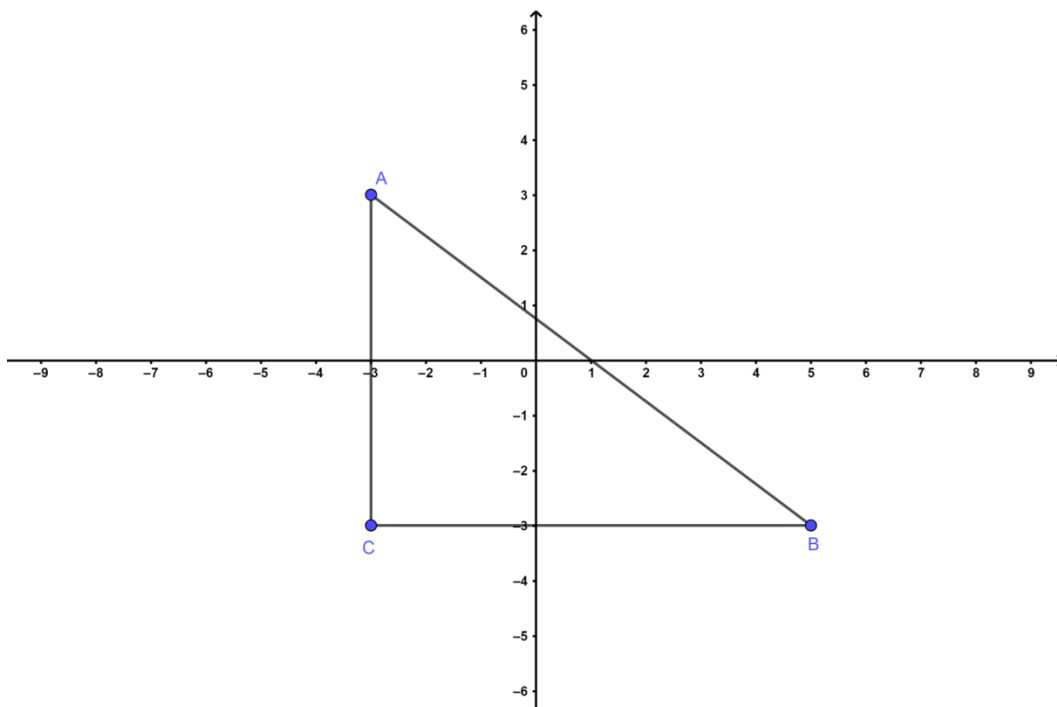
PIZZA DELIVERY

Pizza Hut, a subsidiary of Yum! Brands, serves and delivers more pizzas than any other pizza company in the world. Founded in 1958, Pizza Hut has become the most-recognized pizza restaurant in the world, operating more than 16,900 restaurants in more than 105 countries. In June 1996, Pizza Hut made its foray into India with a restaurant in Bangalore. The restaurant brand offers menu consisting of its signature pizzas, appetizers, pastas, desserts and beverages. Pizza Hut was recently felicitated with the title of India's 70 Most Trusted Power Brands.

One of the Pizza Hut outlets is located at Point A in a city. The grid plan of the city is given below. The outlet requires 13min to prepare a pizza. To compete with other Pizza Companies Pizza Hut promises to deliver Pizza in 30 min. Average speed of delivery boy to deliver pizza is 45 km/hr.

Map showing route options for PIZZA DELIVERY

1 unit = 500m



Question 1:

Pizza Hut outlet received the order from location C at 1:30pm. Give the location of Point C in coordinates.

Question 2:

Find the distance to be covered by delivery boy from A to C?

Question 3:

Pizza Hut outlet received another order from location B at 1:34pm. Delivery Boy has to deliver both the orders. By what time Delivery boy will reach at location B if it takes 3 min to deliver a pizza at a location.

Question 4:

Find the total distance travelled by delivery boy to reach back its outlet after delivering pizzas at location B and C?

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CRITICAL AND CREATIVE THINKING ITEMS

CLASS IX : CHAPTER 4 : LINEAR EQUATIONS IN TWO VARIABLES

INDEX

S.No.	Theme of the item
50.	Stationery items
51.	Birthday party
52.	Price of Chocolates
53.	Apartments
54.	Camp
55.	Plane Crash
56.	Basketball team
57.	Cycle Ergometer
58.	Water Leakage
59.	Friendly Race

Practice Items 01 for Mathematical Literacy

Domain: Mathematical Literacy	Theme: Linear Equation in two variables Stationery items	Class(es): IX Expected time: 10 min Total Credit: 10
Description of Item: Text and Image	Learning Outcomes(As per NCERT): Representing the situation in linear equation in two variables, Representing the linear equation in two variables in graph and Problem solving	

Sanjay bought 5 notebooks and 2 pens for Rs. 120. He told to guess the cost of each notebook and pen to his friends Mohan and Anil. Sanjay has given the clue that both the costs are integers and divisible by 5 such that the cost of a notebook is greater than that of a pen.



Now, Mohan and Anil tried to guess.

Mohan said that price of each notebook could be Rs. 18. Then five notebooks would cost Rs.90, the two pens would cost Rs.30 and each pen could be for Rs. 15.

Anil felt that Rs. 18 for one notebook was too little. It should be at least Rs. 20. Then the price of each pen would also be Rs.10.

Based on the above situation, answer the following questions:

- (i) Write a linear equation in two variables for this situation

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Closed Constructed Response
Cognitive Process	Formulate
Proficiency Level	2

Description of Answer Key and Credits:

Let the cost of one notebook be Rs. x and that of one pen be Rs. y then the linear equation in two variable for the given situation is $5x + 2y = 120$.

Credit Pattern:

Full Credit: 2 for correct equation

No Credit: 0 for incorrect equation

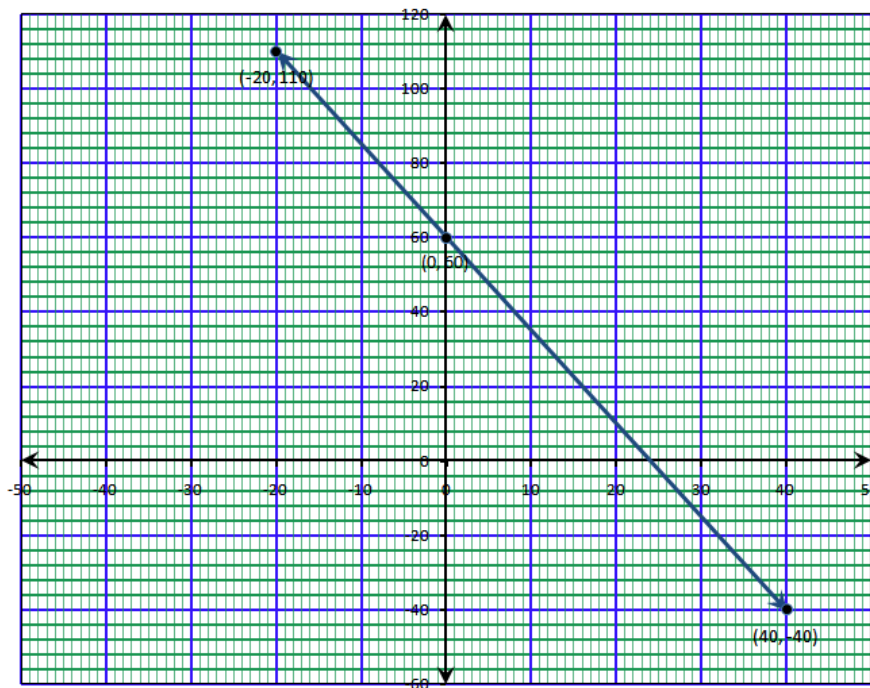
(ii) Draw the graph for this situation.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections and Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Closed Constructed Response
Cognitive Process	Formulate and Employ
Proficiency Level	2

Description of Answer Key and Credits:

Graph of $5x + 2y = 120$ is



Credit Pattern:

Full Credit: 2 for Correct graph
 No Credit: 0 for incorrect graph

(iii) Check whether the answers of Mohan and Anil are correct.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Closed Constructed Response
Cognitive Process	Interpret and Employ
Proficiency Level	2

Description of Answer Key and Credits:

As the costs should be an integer and divisible by 5, therefore the cost estimated by Mohan is wrong. The cost estimated by Anil is right.

Credit Pattern:

Full Credit: 2 for correct answer

No Credit: 0 for any other answer

(iv) Find the cost of a notebook and a pen.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Closed Constructed Response
Cognitive Process	Interpret and Employ
Proficiency Level	2

Description of Answer Key and Credits:

The cost of one notebook is Rs. 20 and the cost of one pen is Rs. 10

Credit Pattern:

Full Credit: 2 for correct answer

No Credit: 0 for any other answer

(v) If Sanjay purchased 8 notebooks and 4 pens, how much money he has to pay to the shopkeeper?

(a) Rs. 150

(b) Rs. 200

(c) Rs. 250

(d) Rs. 300

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Simple Multiple Choice
Cognitive Process	Interpret and Employ
Proficiency Level	1

Description of Answer Key and Credits:

The total cost = $8 \times \text{Rs. } 20 + 4 \times \text{Rs. } 10 = \text{Rs. } 160 + \text{Rs. } 40 = \text{Rs. } 200$

Correct option is (b)

Credit Pattern:

Full Credit: 2 for Correct option is (b)

No Credit: 0 for any other answer

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KVS Region: Hyderabad

Practice Items 02 for Mathematical Literacy

Domain: Mathematical Literacy	Theme: Linear Equation in two variables Birthday party	Class(es): IX Expected time: 10 min Total Credit: 08
Description of Item: Text and Image	Learning Outcomes(As per NCERT): Representing the situation in linear equation in two variables, Representing the linear equation in two variables in graph and Problem solving	

On his birthday, Manoj planned that this time he celebrates his birthday in a small orphanage centre. He bought apples to give to children and adults working there. Manoj donated 2 apples to each children and 3 apples to each adult working there along with Birthday cake. He distributed 60 total apples.



Based on the above situation, answer the following questions:

(i) Write a linear equation in two variables for the above situation in standard form.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Closed Constructed Response
Cognitive Process	Formulate
Proficiency Level	2

Description of Answer Key and Credits:

Let the number of children be x and the number of adults be y then the linear equation in two variable for the given situation is $2x + 3y = 60$.

Credit Pattern:

Full Credit: 2 for correct equation

No Credit: 0 for incorrect equation

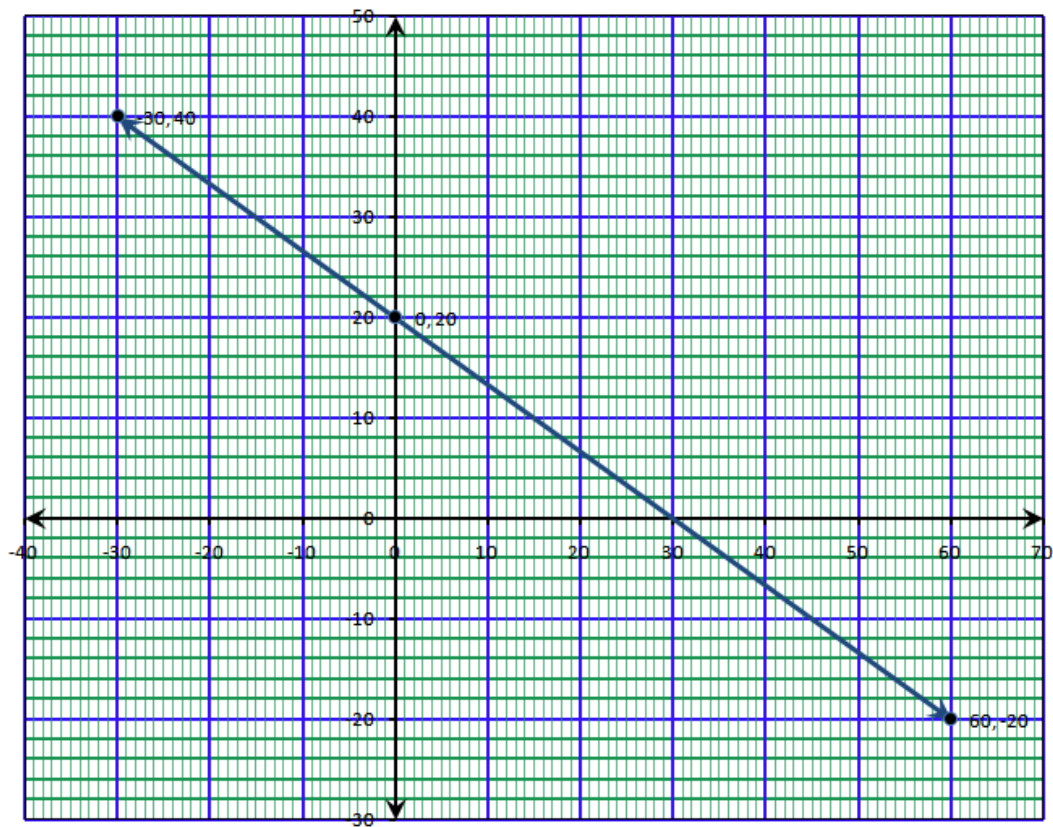
(ii) Draw the graph for this situation.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections and Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Closed Constructed Response
Cognitive Process	Formulate and Employ
Proficiency Level	2

Description of Answer Key and Credits:

Graph of $2x + 3y = 60$ is



Credit Pattern:

Full Credit: 2 for Correct graph

No Credit: 0 for incorrect graph

(iii) How many children are there in the orphanage?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Closed Constructed Response
Cognitive Process	Interpret and Employ
Proficiency Level	2

Description of Answer Key and Credits:

Number of orphans = 15

Credit Pattern:

Full Credit: 2 for correct answer

No Credit: 0 for any other answer

(iv) How many adults working there in the orphanage?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Closed Constructed Response
Cognitive Process	Interpret and Employ
Proficiency Level	2

Description of Answer Key and Credits:

Number of adults working = 10

Credit Pattern:

Full Credit: 2 for correct answer

No Credit: 0 for any other answer

(v) What values of Manoj depicted from the above situation?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Open constructed response
Cognitive Process	Interpret
Proficiency Level	2

Description of Answer Key and Credits:

Manoj is very kind towards orphans.

Credit Pattern:

Full Credit: 2 for any values of Manoj

No Credit: 0 for any irrelevant answer

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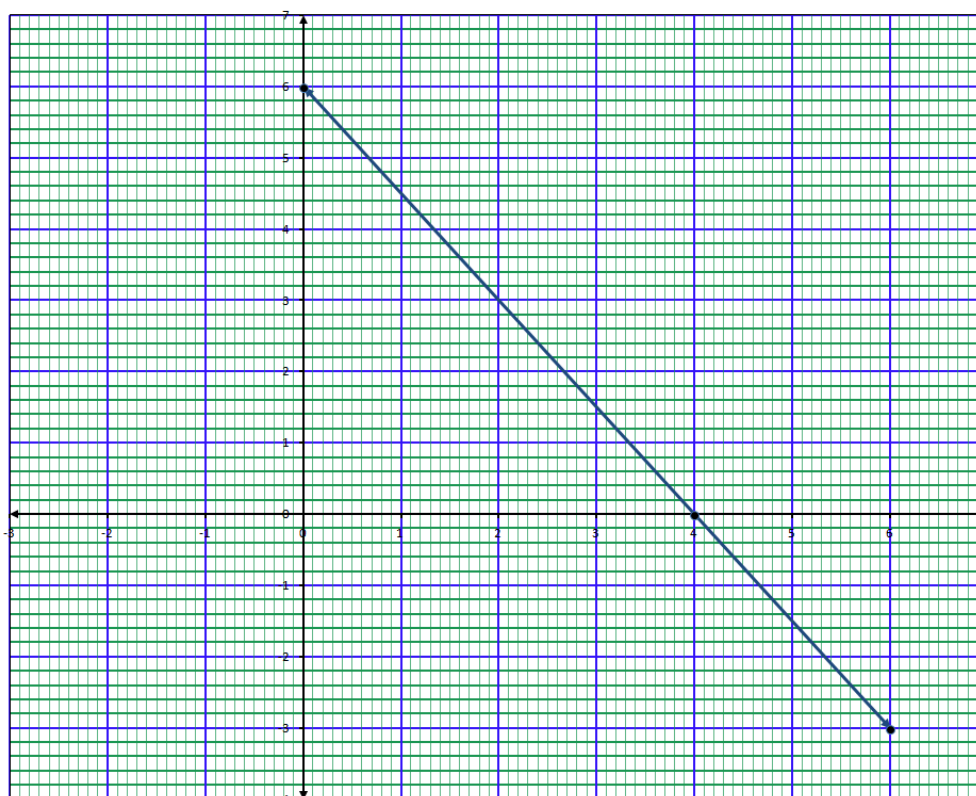
Name of the Vidyalaya: KV Gachibowli

KVS Region: Hyderabad

Practice Items 03 for Mathematical Literacy

Domain: Mathematical Literacy	Theme: Linear Equation in two variables Price of Chocolates	Class(es): IX Expected time: 10 min Total Credit: 08
Description of Item: Text and Graph	Learning Outcomes(As per NCERT): Interpreting the graph, Identifying the linear equation in two variables from the graph and Problem solving	

Aditya purchased two types of chocolates A and B at the rate of Rs. x and Rs. y respectively. The total amount spent is Rs. 12. After reaching home, he forms a linear equation in two variables for two types of chocolates. He prepares a table and a graph of the linear equation as given below:



Based on the above situation and graph, answer the following questions:

(i) Which of the following linear equation in two variables is correct?

(a) $2x + y = 12$

(b) $3x + 2y = 12$

(c) $x + 2y = 12$

(d) $2x + 3y = 12$

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Simple multiple choice
Cognitive Process	Interpret and Employ
Proficiency Level	3

Description of Answer Key and Credits:

(b) $3x + 2y = 12$

Credit Pattern:

Full Credit: 2 for correct option (b)

No Credit: 0 for incorrect option

(ii) How many Chocolates of types A and B purchased?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections and Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Closed Constructed Response
Cognitive Process	Formulate and Employ
Proficiency Level	2

Description of Answer Key and Credits:

Number of Chocolates of type A = 2 and Number of Chocolates of type B = 3

Credit Pattern:

Full Credit: 2 for correct answers of chocolates A and B

Partial credit: 1 for any one correct answer

No Credit: 0 for any other answer

(iii) If Aditya purchased 4 chocolates of type A and 5 Chocolates of type B, then find the total amount.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Closed Constructed Response
Cognitive Process	Interpret and Employ
Proficiency Level	2

Description of Answer Key and Credits:

From the graph, Cost of 1 chocolate A = Rs. 2 and cost of 2 chocolate B = Rs. 3

Total amount = Rs. $3 \times 4 + \text{Rs. } 2 \times 5 = \text{Rs. } 12 + 10 = \text{Rs. } 22$

Credit Pattern:

Full Credit: 2 for correct answer

No Credit: 0 for any other answer

(iv) How many Chocolates A and B can be purchased from an amount of Rs. 36

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Personal
Item format	Closed Constructed Response
Cognitive Process	Interpret and Employ

Proficiency Level	2
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Description of Answer Key and Credits:

Multiply both sides by 3 in $3x + 2y = 12$, we get $9x + 6y = 36$

So, Number of Chocolate A = 9 and Number of Chocolates B = 6

Credit Pattern:

Full Credit: 2 for correct answer

No Credit: 0 for any other answer

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Practice Items 04 for Mathematical Literacy

Domain: Mathematical Literacy	Theme: Linear Equation in two variables Apartments	Class(es): IX Expected time: 10 min Total Credit: 10
Description of Item: Text and Image	Learning Outcomes(As per NCERT): Representing the situation in linear equation in two variables, Representing the linear equation in two variables in graph and Problem solving	

In Hyderabad, a small colony of five Blocks Apartments is there and in each Block, 40 flats are there. The colony has a Resident Welfare Association consisting of executive members from each block. They decided to develop flower beds in the park of the colony and then plant different flower plants in the beds. The difference of three times the money spent on one flower bed and two times the money spent on one flower plants was Rs. 10000. The total number of flower beds develops is 10 and the number of flower plants planted is 100.



Based on the above situation, answer the following questions:

(i) Write a linear equation in two variables for the above situation..

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change & Relationships and Quantity
Context	Public
Item format	Closed Constructed Response
Cognitive Process	Formulate
Proficiency Level	2

Description of Answer Key and Credits:

Let the money spent on one flower bed be Rs. x and that on one flower plant be Rs. y then the linear equation in two variables is $3x - 2y = 10000$

Credit Pattern:

Full Credit: 2 for correct equation

No Credit: 0 for incorrect equation

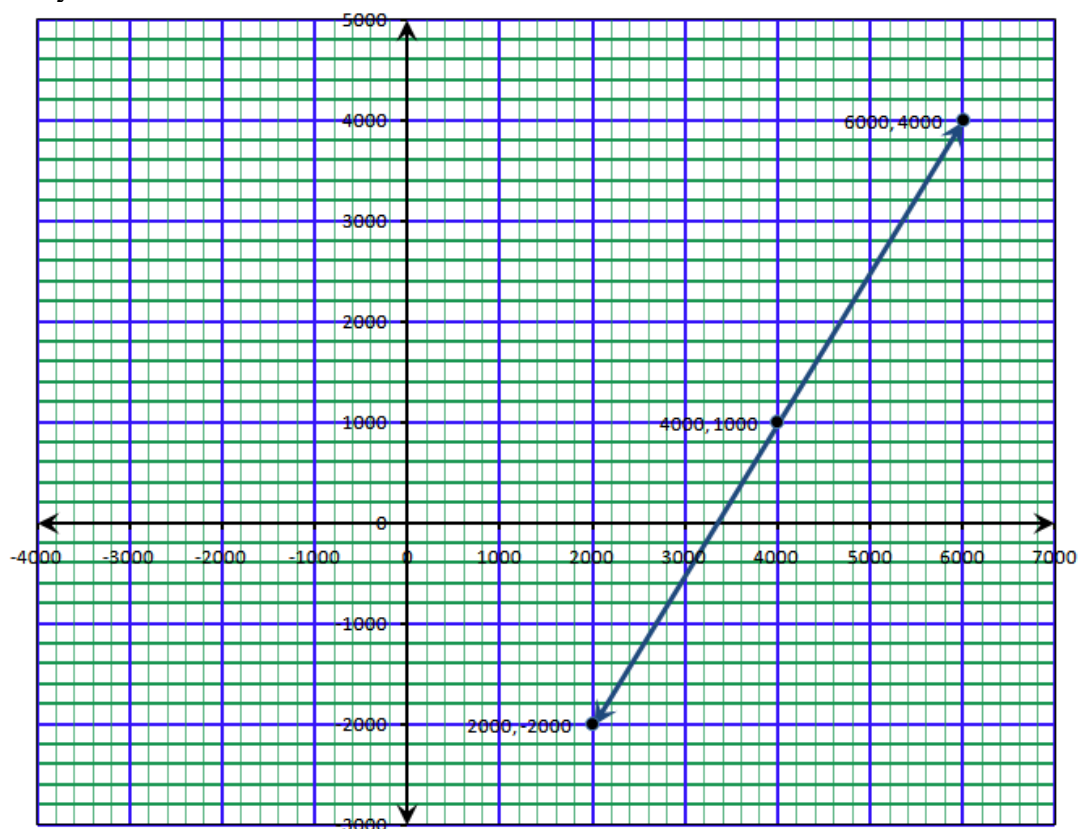
(ii) Draw the graph for this situation.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections and Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Public
Item format	Closed Constructed Response
Cognitive Process	Formulate and Employ
Proficiency Level	2

Description of Answer Key and Credits:

Graph of $3x - 2y = 10000$ is



Credit Pattern:

Full Credit: 2 for Correct graph

No Credit: 0 for incorrect graph

(iii) How much money spent by the Resident Welfare Association?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Public
Item format	Closed Constructed Response
Cognitive Process	Interpret and Employ
Proficiency Level	2

Description of Answer Key and Credits:

From the graph, money spent on one flower bed is Rs. 4000 and that on one flower plant is Rs. 1000. The total amount spent = Rs. 4000 x 10 + Rs. 1000 x 100 = Rs. 140000

Credit Pattern:

Full Credit: 2 for correct answer

No Credit: 0 for any other answer

(iv) How much money has to be spent if total number of flower beds develops are 15 and the number of flower plants planted is 150?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Public
Item format	Closed Constructed Response
Cognitive Process	Interpret and Employ
Proficiency Level	2

Description of Answer Key and Credits:

Amount = Rs. 4000 x 15 + Rs. 1000 x 150 = Rs. 190000

Credit Pattern:

Full Credit: 2 for correct answer

No Credit: 0 for any other answer

(v) What value is indicated in this situation?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change & Relationships and Quantity
Context	Public
Item format	Open constructed response
Cognitive Process	Interpret
Proficiency Level	2

Description of Answer Key and Credits:

Awareness amongst citizens for protection of environment and making pollution free air.

Credit Pattern:

Full Credit: 2 for any relevant values.

No Credit: 0 for any irrelevant answer

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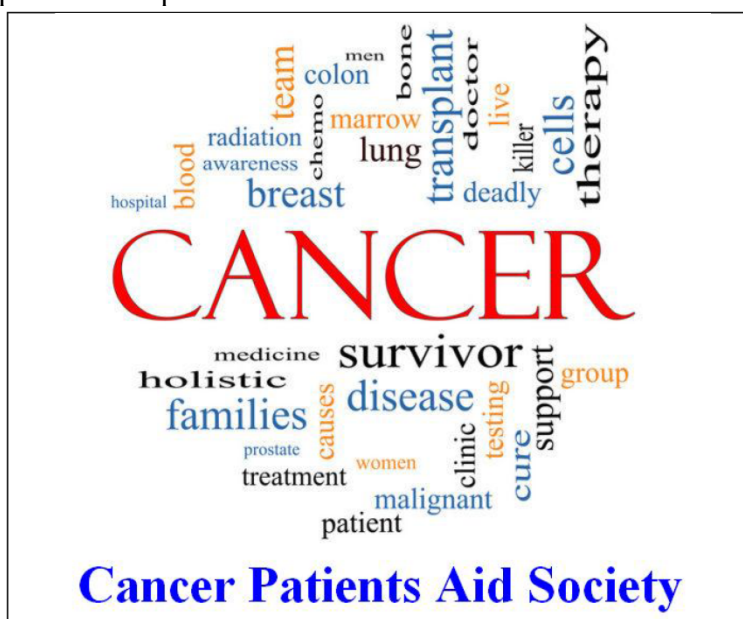
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Practice Items 05 for Mathematical Literacy

Domain: Mathematical Literacy	Theme: Linear Equation in two variables Camp	Class(es): IX Expected time: 10 min Total Credit: 08
Description of Item: Text and Image	Learning Outcomes(As per NCERT): Representing the situation in linear equation in two variables, Representing the linear equation in two variables in graph and Problem solving	

A camp was organized at the school to collect fund for Cancer Patients Aid Society Hospitals. Many children in school donated some money from their pocket money. Anita and Sunita are two students of Class IX. They motivated from this camp and contributed together Rs. 500 from their pocket money to help the cancer patients.



Based on the above situation, answer the following questions:

(i) Write a linear equation in two variables for the above situation..

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change & Relationships and Quantity
Context	Educational/Occupational
Item format	Closed Constructed Response
Cognitive Process	Formulate
Proficiency Level	2

Description of Answer Key and Credits:

Let the money donated by Anita be Rs. x and that by Sunita be Rs. y then the linear equation in two variables is $x + y = 500$

Credit Pattern:

Full Credit: 2 for correct equation

No Credit: 0 for incorrect equation

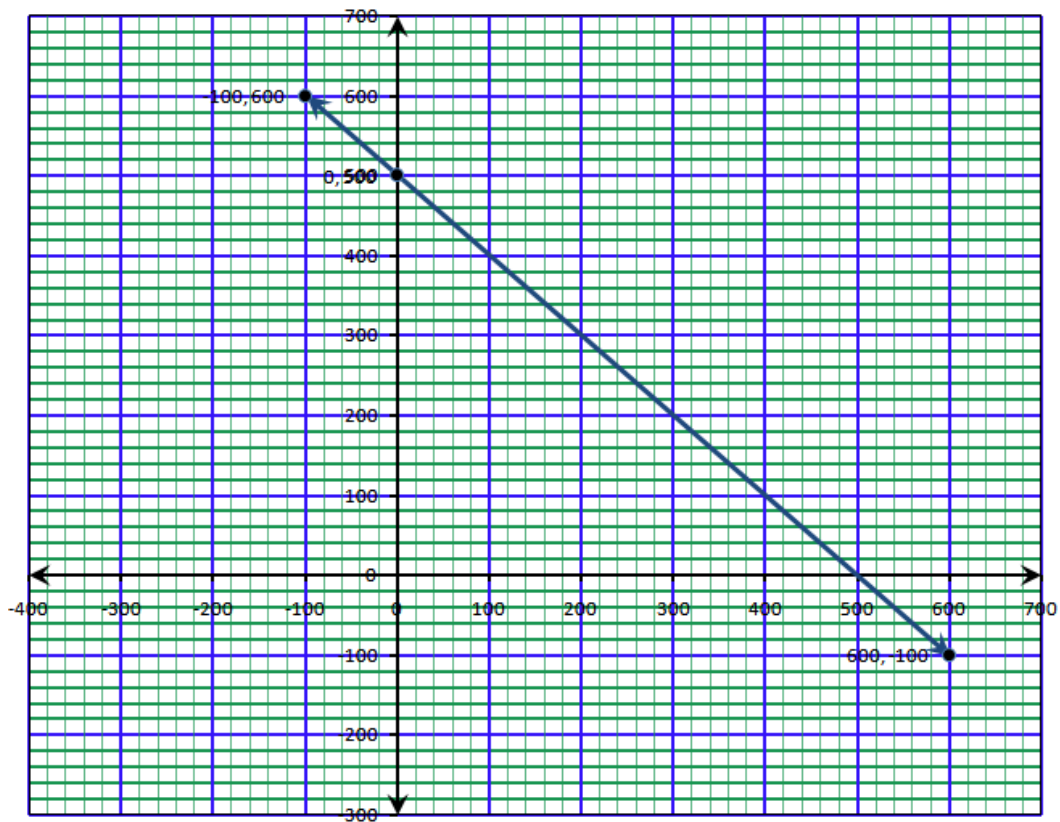
(ii) Draw the graph for this situation.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections and Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Educational/Occupational
Item format	Closed Constructed Response
Cognitive Process	Formulate and Employ
Proficiency Level	2

Description of Answer Key and Credits:

Graph of $x + y = 500$ is



Credit Pattern:

Full Credit: 2 for Correct graph

No Credit: 0 for incorrect graph

(iii) If Sunita contributes Rs. 234, how much money contributed by Anita?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Educational/Occupational
Item format	Closed Constructed Response
Cognitive Process	Interpret and Employ
Proficiency Level	2

Description of Answer Key and Credits:

If Sunita contributes Rs. 234, then money contributed by Anita = Rs. 266

Credit Pattern:

Full Credit: 2 for correct answer

No Credit: 0 for any other answer

(iv) What values of Anita and Sunita are depicted in this situation?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change & Relationships and Quantity
Context	Educational/Occupational
Item format	Open constructed response
Cognitive Process	Interpret
Proficiency Level	2

Description of Answer Key and Credits:

Both have a keep desire to help cancer patients.

Credit Pattern:

Full Credit: 2 for any relevant values.

No Credit: 0 for any irrelevant answer

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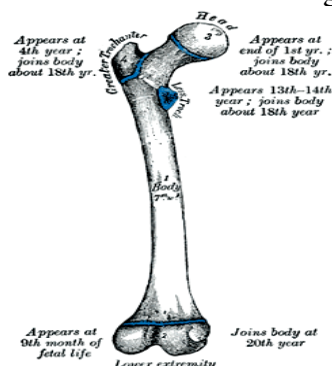
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KVS Region: Hyderabad

Practice Items 06 for Mathematical Literacy

Domain: Mathematical Literacy	Theme: Linear Equation in two variables Plane Crash	Class(es): IX Expected time: 10 min Total Credit: 08
Description of Item: Text, Image & graph	Learning Outcomes(As per NCERT): Representing the situation in linear equation in two variables, Representing the linear equation in two variables in graph and Problem solving	

Geologists went on a plane to survey minerals in a desert there were 3 geologists and a pilot in the plane. Plane was crashed in the desert due to sand storm. The plane broke into pieces. At that time the plane was not traced by the radar. Later, debris of plane bodies of geologists and pilot were covered by sandstorm. After two years on search army man traced the place where the plane was crashed. They dugged out debris of plane and bodies of the men who died in the plane crash. They collected the bones of the geologists and pilot and sent to the forensic lab to identify the persons to whom they belong. From the shape of the pelvis, we can quickly tell that the remains most likely belong to an adult male. Bone length especially the length of long bones like the femur, is related to an individual's over all height.



You plug, your measurement in to an equation used to estimate the overall height of an adult male based on femur length

$$H = 1.88(L) + 32.01 \text{ where } H = \text{height in inches, } L = \text{femur length in inches.}$$

(Conversions, One inch = 2.54cms, 1 feet = 12 inches)

Based on the above situation, answer the following questions:

(i) If the length of femur of a person is 20.2 inches find his overall height in centimeters.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change & Relationships and Quantity
Context	Scientific
Item format	Closed Constructed Response
Cognitive Process	Formulate and Employ
Proficiency Level	3

Description of Answer Key and Credits:

$$H = 1.88(20.2) + 32.01 = 69.986 \text{ inches}$$

$= 69.986 \times 2.54 \text{ cm} = \text{cm} = 177.8 \text{ cm}$ (approximately)

Credit Pattern:

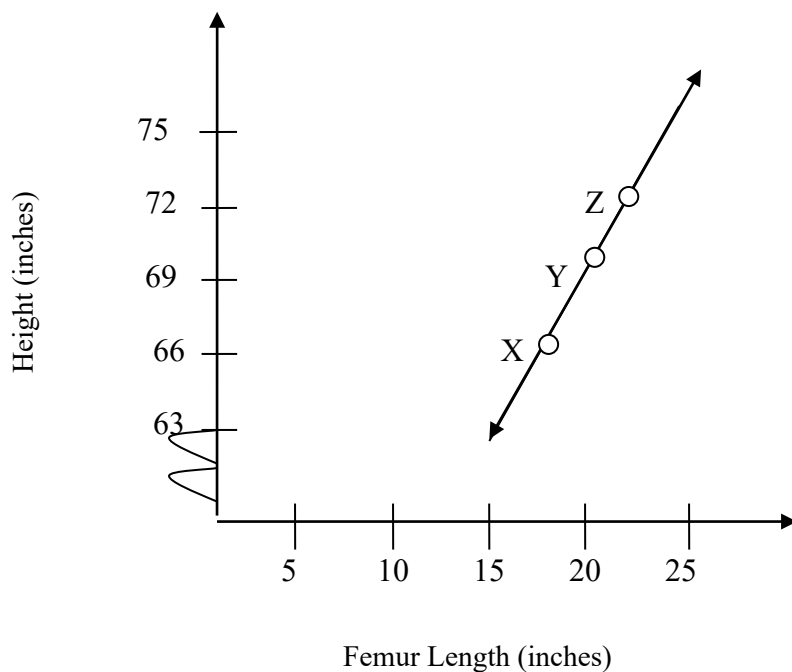
Full credit: 2 for correct answer 177.8cm

Partial credit: 1 for answer 69.986inches

No credit: 0 for any other answer

(ii) Read the graph carefully

Three geologist X, Y and Z were died on a location by an aeroplane crash during a war. After 2 years Army personals found bones, collected and sent to lab. One of the femur bones is 21.28 inches, then calculate his height in feet and find his position on the line in the graph.



Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections and Reflection
Overarching Idea	Change & Relationships and Quantity
Context	Public
Item format	Closed Constructed Response
Cognitive Process	Interpret and Employ
Proficiency Level	3

Description of Answer Key and Credits:

$H = 1.88(21.28) + 32.01 = 72.0164 \text{ inches} = 72.0164 \div 12 = 6 \text{ feet.}$

His position on the graph is Z.

Credit Pattern:

Full Credit: 2 for finding 6 feet.

Partial Credit: 1 for finding position Z on the line in the graph.

No Credit: 0 for any other answer

- (iii) The army men found another set of bones of the pilot. His height is recorded as 5'8". The position of the pilot on the line in the graph is between
 (a) X and Y (b) Y and Z (c) below X (d) above Z

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change & Relationships and Quantity
Context	Scientific
Item format	Simple Multiple choice
Cognitive Process	Interpret
Proficiency Level	2

Description of Answer Key and Credits:

5'8" = 12 x 5 + 8 = 68 inches. The correct option is (a) X and Y

Credit Pattern:

Full Credit: for correct option (a) X and Y

No Credit: for any other option.

- (iv) What is the length of pilot's femur in meters?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change & Relationships and Quantity
Context	Scientific
Item format	Closed Constructed Response
Cognitive Process	Employ
Proficiency Level	3

Description of Answer Key and Credits:

5'8" = 12 x 5 + 8 = 68 inches.

68 = 1.88(L) + 32.01

L = 19.1436 = 19.1436 inches = 19.1436 X 0.0254 m = 0.48624 m = 0.5 m approx.

Credit Pattern:

Full Credit: for answer 0.48624 m or 0.5 m

Partial Credit: for finding answer 19.1436 inches.

No Credit: for any other answer.

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Practice Items 07 for Mathematical Literacy

Domain: Mathematical Literacy	Theme: Linear Equations in two variables Basketball team	Class: IX Expected time: 08 min Total credits: 06
Description of Item: Text and Image	Learning Outcomes(As per NCERT): Representing the situation in linear equation in two variables, Representing the linear equation in two variables in graph and Problem solving	

Basketball is a team sport in which two teams, most commonly of five players each, opposing one another on a rectangular court, compete with the primary objective of shooting a basketball (approximately 9.4 inches (24 cm) in diameter) through the defender's hoop (a basket 18 inches (46 cm) in diameter mounted 10 feet (3.048 m) high to a backboard at each end of the court) while preventing the opposing team from shooting through their own hoop. A field goal is worth two points, unless made from behind the three-point line, when it is worth three. After a foul, timed play stops and the player fouled or designated to shoot a technical foul is given one or more one-point free throws. The team with the most points at the end of the game wins, but if regulation play expires with the score tied, an additional period of play (overtime) is mandated. Points are scored for shooting the basket ball through the hoop. Two points for a goal inside the three point semi circle, and three points for goals scored from outside. Free throws, taken from the free throw line and awarded after a foal, are worth one point.



In a Basket Ball game, Rudrash scored 18 points with a combination of 2-point and 3-point baskets, Charles scored 15 points with a combination of 1-point and 2-point baskets and Salmon scored 10 points with a combination of 1-point and 3 – pont baskets.

Based on the above situation answer the following questions

(i) Write an equation for each player by assigning x for no. of 1 points, y for no. of 2 points and z for no. of 3 points

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	Sports-skills
Item format	Closed constructive
Cognitive Process	Formulate
Proficiency Level	3

Description of Answer key and credits

Rudrash ; $2y+3z=18$, Charles : $x + 2y = 15$ and Salmon : $x + 3z = 10$

Credit Pattern:

Full credits: 2 for all three correct equations

Partial credits: 1 for at least two correct equations

No credits: 0 for any other answer.

(ii) How many possible ways each type of Basket Rudrash can score?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	Sports
Item format	Closed constructive
Cognitive Process	Formulate and employ
Proficiency Level	4

Description of Answer key and credits

The possible ways are

No. of 2 point basket (y)	No. of 3 point basket (z)	Total points
6	2	18
3	4	18
0	6	18
9	0	18

Credit Pattern:

Full credit: 2 for all four correct

Partial credit: 1 for any two correct.

No credit: 0 for any other answer

(iii) If the number of 2-point shot Rudrash made was four greater than the number of 3 point shots he made. Now find for scoring 18 points how many each type of basket did he score ?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships

Context	Sports
Item format	Closed constructive
Cognitive Process	Employ
Proficiency Level	3

Description of Answer key and credits

$2y+3z = 18$, since $y = 4+z$, by solving these two equations we get $y = 4$ and $z = 3$.

Credit Pattern:

Full credit: 2 for correct answer.

No credit: 0 for any other answer.

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Practice Items 08 for Mathematical Literacy

Domain: Mathematical Literacy	Theme: Linear Equation in two variables Cycle Ergometer	Class(es): IX Expected time: 10 min Total Credit: 06
Description of Item: Text, Image & graph	Learning Outcomes(As per NCERT): Representing the situation in linear equation in two variables, Representing the linear equation in two variables in graph and Problem solving	

The cycle Ergometer with Vibration isolation stabilization (CEVIS) is similar to a stationary mechanical bicycle and is connected to the International Space Station (ISS) with wire letters. It also sits on a vibration isolation system which reduces impacts to the ISS. Astronauts snap their shoes on to the pedal and use a seat belt to hold them on the bicycle. They can change the work load (the force with which they must push on the pedals) to maximize their workout the speed is also adjusted to keep the astronaut's heart rate at a specific target which is tracked with a heart rate monitor.

Part of the daily routine of a crew member on this ISS is to exercise. CEVIS, the exercise bike has a control panel with loaded protocols to increase and decrease the loads, but if it fails, astronauts control the setting with a less sophisticated back up display. Astronauts have reference cards that show the setting for adjusting the controls according to the prescriptions given to them by the medical doctor. Astronauts and medical and exercise specialists need to under algebra.



Suppose an astronaut looks at his prescription and finds that he has been asked to move to a new voltage and power on CEVIS. Table – I shows the information provided on the reference cards to be adjust the CEVIS's power. The astronaut must first change the voltage setting by turning the voltage setting by turning the voltage knob.

CEVIS VOLTAGE VERSES POWER

Voltage, V(volts)	Power, P (watts)
0.6	2.5
1.2	50
3.0	125
4.8	200
5.4	225
6.4	275

8.4	350
-----	-----

Based on the above situations, answer the following questions

(i) Find relationship between the voltage values and power values and express in an equation, power in terms of voltage.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	Scientific
Item format	Closed constructive
Cognitive Process	Formulate
Proficiency Level	3

Description of Answer key and credits

Find ratio of P to that of V as watts per volts. $25/0.6 = 50/1.2 = 125/3.0 = \dots = 41.7$.
 Since $p/v = 41.7$ and the required equation is $P = 41.7 V$

Credit Pattern:

Full credits: 2 for the correct equation $P = 41.7 V$

No credits: 0 for any other answer

(ii) Suppose you are an astronaut and you are prescribed a power of 200 watts then, what voltage is required to achieve 200 watts?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	Scientific
Item format	Closed constructive
Cognitive Process	Employ
Proficiency Level	3

Description of Answer key and credits

$P = 41.7 V$, For value of $p = 200$ watts finding the value $V = 4.8$ volts (approx).

Credit Pattern:

Full credit: 2 for the correct answer $v = 4.8$ volts.

Partial credit: 1 for any one of the answers

No credit: 0 for any other answer.

(iii) An astronaut's prescription also included a change in speed on CEVIS. In order to adjust the speed in Rotations Per Minute (RPM) the voltage knob is turned. The table below given voltage and resulting speed.

Voltage, V (volts)	Speed, S (RPM)
2	30
3	45
5	75

Write the linear equation that represents the information in the above table. Use V for voltage and S for speed for variables.

Since you are an astronaut and advised to make an adjustment on CEVIS to a new speed of 135 RPM. What voltage is required to achieve 135 RPM?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	Scientific
Item format	Closed constructive
Cognitive Process	Formulate
Proficiency Level	3

Description of Answer key and credits

For writing equation (i) $S = 15V$ and (ii) value $V=9$ volts.

Credit Pattern:

Full Credit: 2 for finding both (i) and (ii).

Partial Credit: 1 for finding any one of the answer

No credit: 0 for any other answers.

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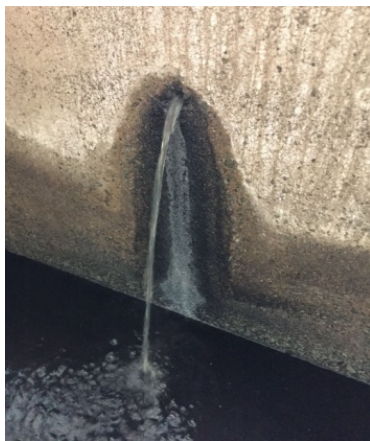
Name of the Vidyalaya: KV Kurnool

KVS Region: Hyderabad

Practice Items 09 for Mathematical Literacy

Domain: Mathematical Literacy	Theme: Linear Equation in two variables Water Leakage	Class(es): IX Expected time: 10 min Total Credit: 08
Description of Item: Text, Image & graph	Learning Outcomes(As per NCERT): Representing the situation in linear equation in two variables, Representing the linear equation in two variables in graph and Problem solving	

Water is leaking from water tanks at a linear rate. The amount of water, in liters, is measured at the start of each day. At the end of a day and its alternate day the capacity of water in the tanks are given as shown below.



Tank A



Tank B



Tank C

Tank/day	1	2	3	4	5
A	2950 lit		2850 lit		
B		3800 lit		3600lit	
C			3700 lit		3300 lit

(i) Determine the amount of water that was initially in the tanks.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	consumption of natural resources
Item format	Closed constructive
Cognitive Process	Employ
Proficiency Level	2

Description of Answer key and credits

Capacity of Tank A 3000 lit, Tank B 4000 lit and Tank C 5000 lit.

Credit Pattern:

Full credit: 2 for all correct answers

Partial credit: for at least two correct answers

No credit: 0 for all incorrect or one is correct

(ii) Frame equations that find amount of water (w) in liters, at the end of any day (d). Use variables w for water and d for days.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	Consumption of natural resources
Item format	Closed constructive
Cognitive Process	Formulate
Proficiency Level	3

Description of Answer key and credits

Tank A: $w = 3000 - 50d$, Tank B : $w = 4000 - 100d$ and Tank C : $w = 5000 - 200d$

Credit Pattern:

Full Credit: 2 for all correct answers

Partial credit: 1 for at least one correct

No credit: 0 for any other answers

(iii) Assume that once water is filled in the tanks, then later water is not used and not filled but the water is being leaked. Which tank will be emptied in 25 days ?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	Consumption of natural resources
Item format	Closed constructive
Cognitive Process	Employ
Proficiency Level	3

Description of Answer key and credits

$5000 - 200d = 0$ which gives $d = 25$. Tank C will be emptied in 25 days

Credit Pattern:

Full credits : for the correct answer

No credits: for any other answer.

(iv) After how many days the capacity of water is equal in tank B and C?

(a) 12 (b) 10 (c) 12.5 (c) 8.5

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	Consumption of natural resources
Item format	Short multiple choice
Cognitive Process	Formulate

Proficiency Level	2
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Description of Answer key and credits

$4000 - 100d = 5000 - 200d$ solving this we get $d = 10$ days.

The correct answer is (b) 10

Credit Pattern:

Full credit: 2 for the correct answer.

No credit: 0 for any other answer.

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Practice Items 10 for Mathematical Literacy

Domain: Mathematical Literacy	Theme: Linear Equation in two variables Friendly Race	Class(es): IX Expected time: 10 min Total Credit: 10
Description of Item: Text, Image & graph	Learning Outcomes(As per NCERT): Representing the situation in linear equation in two variables, Representing the linear equation in two variables in graph and Problem solving	

A fun run is a friendly race that involves either road running or cross country running with participants taking part for their own enjoyment rather than competition. A fun run will usually be held to raise funds for a charity with sponsors providing the revenue to cover organizational costs. Fun runs can include novelty categories, such as wearing costumes and age categories for child, teen and mature. One of the biggest annual fun runs in Europe is “la cursa El corte Ingles” in Barcelona with about 55,000 participants.



The entry fee for a charity fun run event is \$ 18. It costs event organizers \$2550 for the hire of the tent and \$ 3 per entry for administration. Any profit will be donated to local charities .

Based on the above situation, answer the following questions:

(i) Let R is the total amount collected in entry fees, in dollars, and n is the number of entries. Set up an equation to find the entry fee ‘ a ’ for one participant. What is the value of ‘ a ’ in the above data?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	Public
Item format	Closed constructive
Cognitive Process	Formulate
Proficiency Level	1

Description of Answer key and credits

$R = an$, $a = R/n$: Value of $a = 18$.

Credit Pattern:

Full credit: 2 for finding both

Partial credit: 1 for any one answer

No credit: 0 for any other answers

(ii) The equation that represents the cost for the event (C) is $C = 2550 + bn$. Write an equation for the values of 'b'.? Find the value of 'b' in the given data.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	Public
Item format	Short Response Item
Cognitive Process	Formulate
Proficiency Level	1

Description of Answer key and credits

The equation for $b = (C - 2550) \div n$; The value of $b = 18$.

Credit Pattern:

Full credit: 2 for both correct answer

Partial credit: 1 for any one answer

No credit: 0 for any other answer

(iii) By solving the equations simultaneously, determine the number of entries needed to break event?

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	Public
Item format	Closed constructive
Cognitive Process	Employ
Proficiency Level	3

Description of Answer key and credits

170 entries

Credit Pattern:

Full credit: 2 for the correct answer

No credit: 0 for any other answer

(iv) A total of 310 entries are received for this charity event. Show that the organizers will be able to donate \$ 2100 to local charities.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	Public
Item format	Closed constructive
Cognitive Process	Employ
Proficiency Level	3

Description of Answer key and credits

$R = 319 \times 18 = \$5580$, $C = 2550 + 3 \times 310$ and the donation for charity = $R - C = \$ 2100$

Credit Pattern:

Full credit: 2 for the correct values of R and C

Partial credit: 1 for any one of the correct values R and C

No credit: 0 for any other answer.

(v) Determine the number of entries needed to denote \$ 5010 to local charities.

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Connections
Overarching Idea	Change and Relationships
Context	Public
Item format	Closed constructive
Cognitive Process	Employ
Proficiency Level	3

Description of Answer key and credits

504 entries

Credit Pattern:

Full credits : for correct answer

No credits: for any other answer.

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CRITICAL AND CREATIVE THINKING ITEMS

CLASS IX : CHAPTER 5 : INTRODUCTION TO EUCLID GEOMETRY

INDEX

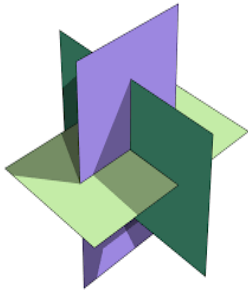
S.No.	Theme of the item
60.	Curves and lines
61.	Row houses
62.	Discussion of two friends
63.	Euclid's fifth postulate
64.	John Playfair's view
65.	Prime minister's relief fund
66.	Application of axiom 5
67.	Applications of Euclid's geometry
68.	Benefits of CNG
69.	A story of two friends

EUCLID'S GEOMETRY QUESTIONS CLASS IX

TEST ITEM 1 CURVES AND LINES

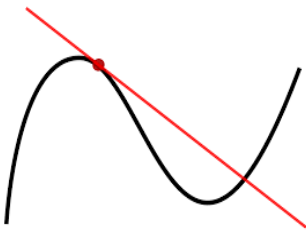
Plane

A plane is a 2-dimensional figure which we can extend infinitely and is flat. Therefore, the Plane includes 2D figures like quadrilaterals, triangles and includes areas and perimeters.



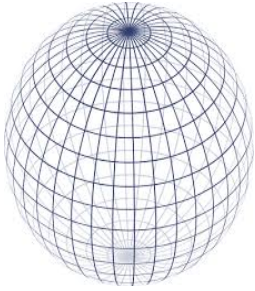
Curve

A curve is a 1-dimensional entity which can be a straight line or a curved entity. In other words, a curve is a one-dimensional mathematical entity that may be straight or not! Hence, every line – straight or not can be a curve.



Surface

A surface is a 2D or a 3D construction in space or a plane with no thickness. Therefore, we use it in the calculation of surface area.



1.1 Which of the following are the boundaries of a surface?

(a) Lines (b) curves (c) surfaces (d) points

(i) a and b (ii) a and c (iii) b and c (iv) c and d

1.2 A curve which has 2 end points is called

A) Open Curve B) Closed Curve C) Simple Curve D) None of the Above

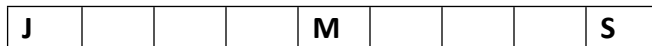
1.3 Encircle the correct answer:

STATEMENT	CORRECT / INCORRECT
(i) In Euclid's Geometry, point, line and plane are undefined terms.	CORRECT / INCORRECT
(ii) Two lines drawn in a plane always intersect at a point.	CORRECT / INCORRECT

TEST ITEM 2 ROW HOUSES



Three friends Jeniee, Maggie and Sam live in the houses which are in one row. Jeniee lives in the first house, Maggie in the fifth house and Sam in the ninth house.



Jeniee

Maggie

Sam

2.1 If all the houses are alike and if $JM = MS$ then what is the relation between JM and JS ?

(a) $JM = JS$ (b) $JM = \frac{1}{2} JS$ (c) $JM = \frac{2}{3} JS$ (d) none of these.

2.2 When all the houses lie in a row, what do you call them ?

(a) Coplanar (b) coincident (c) concurrent (d) collinear
 (i) a and c (ii) a and d (iii) b and c (iv) c and d

2.3 A new friend Tinny (T) started to live in the new house no 13. If $JM = MS$ and $MS = ST$ then is $JM = ST$? By which axiom?

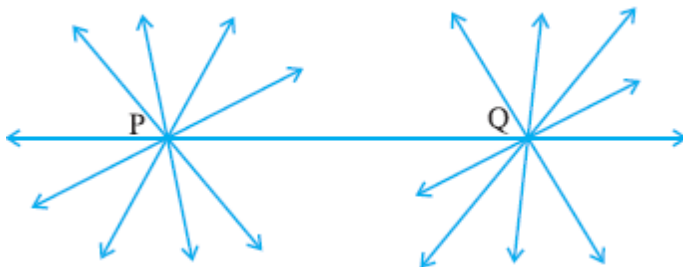


2.4 Given three collinear points J, M, S. name all the line segments.

TEST ITEM 3 DISCUSSION OF TWO FRIENDS



3.1 Vincent and William were discussing about some geometrical concepts. William drew one figure and asked Vincent how many lines pass through both the points P and Q? He answered infinite lines. Do you agree?



3.2 Then it was Vincent's turn. He also drew one figure and asked William, if $AC = BD$ then what will be the relation between AB and CD ? What should be William's answer?



(a) $AB = CD$ (b) $AB = \frac{1}{2} CD$ (c) $AB = AC - CD$ (d) $AB + BC = CD$

3.3 Then Rama asked Aditya. What is the minimum number of lines required to make a closed polygon?

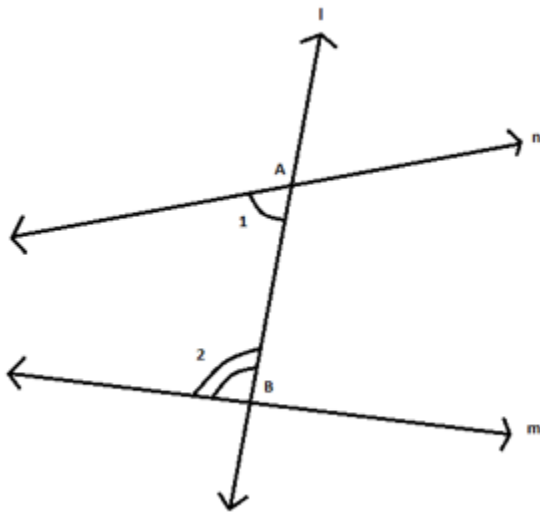
3.4 What do you call a closed figure formed by three line segments only?

TEST ITEM 4 EUCLID'S FIFTH POSTULATE



Geometry is in everything. The first attempts at understanding this art of nature were made even before recorded history. However, the most notable and influential was the Euclid Geometry. Euclid of Alexandria developed one of the most beautiful and the most interesting treatise of mathematics – Elements. Any statement that is assumed to be true on the basis of reasoning or discussion is a postulate. His fifth postulate is very important. It is

“If a straight line falling on two straight lines makes the interior angles on the same side of it taken together less than two right angles, then the two straight lines, if produced indefinitely, meet on that side on which the sum of angles is less than two right angles.”



Circle the correct or incorrect for each of the following statements :

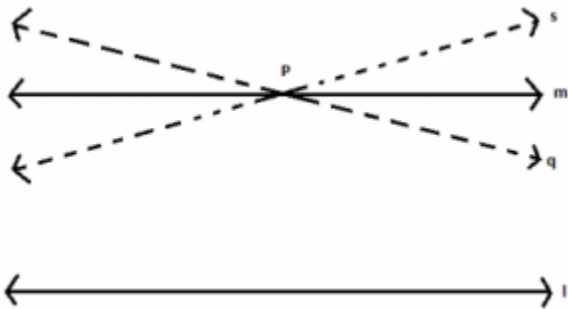
Statement	Correct/ Incorrect
4.1 In this figure, 4 interior angles are formed.	Correct/ Incorrect
4.2 If the sum of interior angles $\angle 1$ and $\angle 2$ is	Correct/ Incorrect

less than two right angles, lines n and m will meet on the right side of line l.	
4.3 If the sum of interior angles $\angle 1$ and $\angle 2$ is equal to two right angles, lines n and m will be parallel.	Correct/ Incorrect

TEST ITEM 5 JOHN PLAYFAIR'S VIEW



The equivalent version of Euclid's fifth postulate was given by John Playfair. As per him: 'For every line l and for every point P not lying on l , there exists a unique line m passing through P and parallel to l '.



In the above figure, consider line l and a point P not lying on l .

5.1 How many lines can pass through the point P ?

- (a) One (b) infinite (c) three (d) four

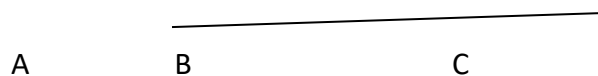
5.2 How many lines passing through P and parallel to line l ?

- (a) One (b) infinite (c) three (d) four

5.3 In the figure which line is parallel to line l ?

- (a) Line s (b) line m (c) line q (d) none of these

5.4 If B lies between A and C , $AC = 12$ cm and $BC = 9$ cm. What is AB^2 ?



5.5 If $AB = x + 3$, $BC = 2x$ and $AC = 4x - 5$, then what will be the value of x if B lies on AC ?

TEST ITEM 6

PRIME MINISTER'S RELIEF FUND

Rahman and Prakash contributed equal amount towards Prime Minister Relief Fund. Prakash and Rahul contributed equal amount towards Prime Minister Relief Fund if Rahul contributed Rs. 500.



6.1 How much Rahman contributed?

6.2 Which Euclid axiom helps in reaching the correct answer?

6.3 What is average amount of their contribution?

6.4 What values are depicted by them?

TEST ITEM 7**APPLICATION OF AXIOM 5**

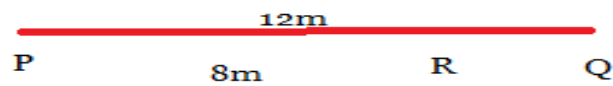
PQ is a line segment 12cm long and R is a point in its interior such that PR=8cm.

7.1 In which ratio point R divides line segment PQ.

- (a) 1:2 (b) 2:3 (c) 3:2 (d) 2:1

7.2 Find the value of $PQ^2 + PR^2 - 2PQ \cdot PR$

Ans:-



TEST ITEM 8

APPLICATIONS OF EUCLIDSGEOMETRY

In Mathematics, a statement is something that can either be true or false for everyone. For example: The sun rises in the East. In other words, if a statement has the same meaning everywhere and can either be true or false, it is a Mathematical statement.

A statement is a non-mathematical statement if it does not have a fixed meaning, or in other words, is an ambiguous statement. For example, "It's a lovely day.". The statement is an opinion and will have a different meaning for different people, so its meaning is ambiguous.

8.1 Categorize the given statement as a Mathematical or a non Mathematical statement :

(i) The mass of the earth is greater than the moon .

Ans : _____

(ii) Selena said her brother "Open all the doors and windows."

Ans: _____

CONJECTURE

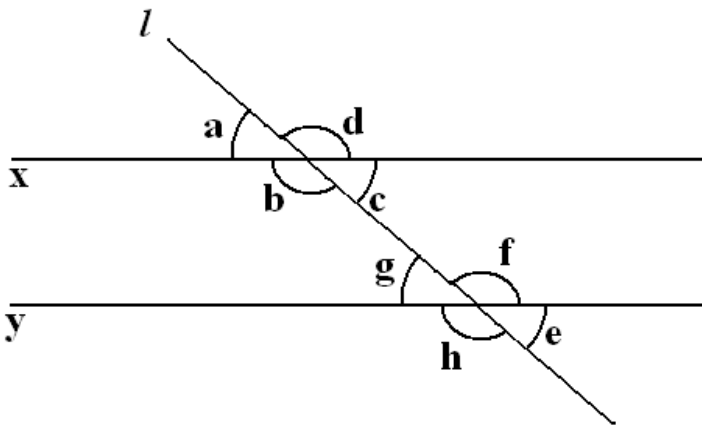
The formation or expression of an opinion or theory without sufficient evidence for proof is known as Conjecture . It is a statement that we arrive on with logical reasoning.

8.2 In the given series of number 13,26,39 , the fifth term is 65 . Can this statement be termed as conjecture ? Explain.

Axiom

The word 'Axiom' is derived from the Greek word 'Axioma' meaning 'true without needing a proof'. A mathematical statement which we assume to be true without a proof is called an axiom. Examples of axioms can be $2+2=4$, $3 \times 3=9$ etc. In geometry, we have a similar statement that a line can extend to infinity

8.3 In the given figure the lines x and y are parallel because the value of $d=f$. Can we term the above statement as axiom? Give reason .



TEST ITEM 9

BENEFITS OF CNG

In a society the numbers of persons using CNG instead of petrol for their vehicles has increased by 15 and now the number is 25 .



9.1 Form a linear equation for the above .

9.2 Solve the above equation by Euclid's Axiom.

9.3 Which values are depicted by the society ?

9.4 What is the full form of CNG ?

TEST ITEM 10 A STORY OF TWO FRIENDS

Axioms or Postulates are defined as a statement that is accepted as true and correct. Axioms present themselves as self-evidence on which you can base any arguments or inferences. These are universally accepted and general truths. Euclid's axioms are

- (1) Things which are equal to the same thing are equal to one another.
- (2) If equals are added to equals, the wholes are equal.
- (3) If equals are subtracted from equals, the remainders are equal.
- (4) Things which coincide with one another are equal to one another.
- (5) The whole is greater than the part.
- (6) Things which are double of the same things are equal to one another.
- (7) Things which are halves of the same things are equal to one another.

10.1 Ben and Zen have the same weights say x kg. After some time they gain weight by 5 kg.

What will be their present weights?

- (a) $5x$ (b) $x + 5$ (c) $x - 5$ (d) none of these.

10.2 Which Euclid's axiom states that their present weights will be equal.

10.3 These two friends then worked together and they have equal salary. But due to recession, their salaries are made half. The final salary of Ben and Zen will still be equal. (true/ false)?

10.4 Which Axiom of Euclid tells us this rule?

FINAL QUESTIONS OF EUCLID'S GEOMETRY

TEST ITEM 1.1 CURVES AND LINES

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students aware of the concepts of curves and lines.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Reflection
Overarching Idea	Space and Shape
Context	Scientific
Item Format	Complex multiple choice
Cognitive process	Interpreting
Proficiency level	3

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS 1.1 Full credit : (i)a and b No creditOther responses and missing
--

TEST ITEM 1.2 CURVES AND LINES

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students aware of the concepts of curves and lines.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Reflection
Overarching Idea	Space and Shape
Context	Scientific
Item Format	Simple multiple choice
Cognitive process	Interpreting
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS

Full credit : A) Open Curve

No Credit : Other responses and missing

TEST ITEM 1.3 CURVES AND LINES

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students aware of the concepts of curves and lines.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Reflection
Overarching Idea	Space and Shape
Context	Scientific
Item Format	Closed constructed response
Cognitive process	Interpreting
Proficiency level	3

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS Full credit : (i) correct (ii) incorrect
Partial Credit :If any one answer is correct
No credit : Other responses and missing

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Name of the Vidyalaya: K. V. Mhow

KVS Region: Bhopal

TEST ITEM 2.1 ROW HOUSES

DOMAIN :- MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT, IMAGE AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the Euclid's Axioms.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Change and relationship
Context	Societal
Item Format	Simple multiple choice
Cognitive process	Interpreting ,
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS 2.1 (b) $JM = \frac{1}{2} JS$

No credit Other responses and missing

TEST ITEM 2.2 ROW HOUSES

DOMAIN :- MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the Euclid's Axioms.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
-----------	-----------------

Competency Cluster	Connection
Overarching Idea	Change and relationship
Context	Societal
Item Format	Complex multiple choice
Cognitive process	Interpreting ,
Proficiency level	3

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS Full credit(ii) a and d No credit Other responses and missing

TEST ITEM 2.3 ROW HOUSES

DOMAIN :- MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the Euclid's Axioms.

Mathematical Literacy

FRAMEWORK	CHARACTERSTICS
Competency Cluster	Connection
Overarching Idea	Change and relationship
Context	Societal
Item Format	Closed constructed response
Cognitive process	Interpreting ,
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS Full credit true. Things which are equal to the same thing are equal to one another.
No credit Other responses and missing

TEST ITEM 2.4 ROW HOUSES

DOMAIN :- MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the Euclid's Axioms.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Change and relationship
Context	Societal
Item Format	Open constructed response
Cognitive process	Interpreting ,
Proficiency level	3

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS Full credit JM, MS, JS
Partial credit if two written correctly.
No credit Other responses and missing

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KVS Region: Bhopal

TEST ITEM 3.1 DISCUSSION OF TWO FRIENDS

DOMAIN :- MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the Euclid's Postulates.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	reflection
Overarching Idea	Change and relationship
Context	Societal
Item Format	Short response item
Cognitive process	Interpreting ,
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS 3.1 No. only one line.

No credit Other responses and missing

TEST ITEM 3.2 DISCUSSION OF TWO FRIENDS

DOMAIN :- MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the Euclid's Postulates.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	reflection
Overarching Idea	Change and relationship
Context	Societal

Item Format	Simple multiple choice
Cognitive process	Interpreting ,
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS

Full credit AB = CD

No credit Other responses and missing

TEST ITEM 3.3 DISCUSSION OF TWO FRIENDS

DOMAIN : - MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the Euclid's Postulates.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	reflection
Overarching Idea	Change and relationship
Context	Societal
Item Format	Short response item
Cognitive process	Interpreting ,
Proficiency level	3

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS Full credit 3.

No credit Other responses and missing

TEST ITEM 3.4 DISCUSSION OF TWO FRIENDS

DOMAIN :- MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the Euclid's Postulates.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	reflection
Overarching Idea	Change and relationship
Context	Societal
Item Format	Closed constructed response
Cognitive process	Interpreting ,
Proficiency level	1

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS Full credit triangle
No credit Other responses and missing

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KVS Region: Bhopal

TEST ITEM 4.1 EUCLID'S FIFTH POSTULATE

DOMAIN : - MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the concept of parallel and nonparallel lines

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	reflection
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Closed constructed responses
Cognitive process	Interpreting ,.
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS 4.1 correct

No credit Other responses and missing

TEST ITEM 4.2 EUCLID'S FIFTH POSTULATE

DOMAIN :- MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the concept of parallel and nonparallel lines

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	reflection
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Closed constructed responses
Cognitive process	Interpreting ,.
Proficiency level	3

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS 4.2 incorrectl

No credit Other responses and missing

TEST ITEM 4.3 EUCLID'S FIFTH POSTULATE

DOMAIN :- MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the concept of parallel and nonparallel lines

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	reflection
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Closed constructed responses
Cognitive process	Interpreting ,.
Proficiency level	4

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS

Full credit correct

No credit Other responses and missing

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Name of the Vidyalaya: K. V. Mhow

KVS Region: Bhopal

TEST ITEM 5.1 JOHN PLAYFAIR'S VIEW

DOMAIN : - MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the Equivalent version of Euclid's fifth Postulate.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	reflection
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Simple multiple choice
Cognitive process	Interpreting ,.
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS 5.1 (b) infinite

No credit Other responses and missing

TEST ITEM 5.2 JOHN PLAYFAIR'S VIEW

DOMAIN : - MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the Equivalent version of Euclid's fifth Postulate.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
-----------	-----------------

Competency Cluster	reflection
Overarching Idea	Change and relationship
Context	Scientific
Item Format	simple multiple choice
Cognitive process	Interpreting ,.
Proficiency level	3

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS Full credit (a) One No credit Other responses and missing

TEST ITEM 5.3 JOHN PLAYFAIR'S VIEW

DOMAIN :- MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the Equivalent version of Euclid's fifth Postulate.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	reflection
Overarching Idea	Change and relationship
Context	Scientific
Item Format	simple multiple choice
Cognitive process	Interpreting ,.
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS
 Full credit (b) line m
 No credit Other responses and missing

TEST ITEM 5.4 JOHN PLAYFAIR’S VIEW

DOMAIN :- MATHEMATICAL LITERACY	THEME :- EUCLID’S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the Equivalent version of Euclid’s fifth Postulate.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	reflection
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Closed constructed response
Cognitive process	Interpreting ,.
Proficiency level	3

Credit Pattern:

Full Credit: 2
 Partial Credit: 1
 No Credit: 0

Description of Answer Key and Credits:

Full credit 9
 No credit Other responses and missing

TEST ITEM 5.5 JOHN PLAYFAIR’S VIEW

DOMAIN :- MATHEMATICAL LITERACY	THEME :- EUCLID’S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND SHAPE	LEARNING OUTCOMES :-	To make the students aware of the Equivalent version of Euclid’s fifth Postulate.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	reflection
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Closed constructed response
Cognitive process	Interpreting ,.
Proficiency level	3

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS :- Full credit $x = 8$

Partial credit : - $AB + BC = AC$

No credit:- Other responses and missing

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TEST ITEM 6.1

PRIME MINISTER'S RELIEF FUND

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students aware of the properties of Euclid's Geometry

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
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Competency Cluster	Connections
Overarching Idea	Change and relationship
Context	Societal
Item Format	Closed constructed response
Cognitive process	Interpreting , employ
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS Full credit Rs 500 No credit Other responses and missing

TEST ITEM 6.2

PRIME MINISTER'S RELIEF FUND

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students aware of the properties of Euclid's Geometry

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Change and relationship
Context	Societal
Item Format	Closed constructed response
Cognitive process	Interpreting , employ
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

Full credit:- Axiom 1 If $A = B, B = C \Rightarrow A = C$ No credit:- Other responses and missing
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TEST ITEM 6.3

PRIME MINISTER’S RELIEF FUND

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students aware of the properties of Euclid’s Geometry

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Change and relationship
Context	Societal
Item Format	Short response item
Cognitive process	Interpreting , employ
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS
Full credit:-Rs. 500
No credit:- Other responses and missing

TEST ITEM 6.4

PRIME MINISTER’S RELIEF FUND

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students aware of the properties of Euclid’s Geometry

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
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Competency Cluster	Connections
Overarching Idea	Change and relationship
Context	Societal
Item Format	Open constructed response
Cognitive process	Interpreting , employ
Proficiency level	3

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS

Full credit: Value of help, care and concern towards other is shown by contributing towards Prime minister Relief Fund.

Partial credit if any similar values are correct.

No credit Other responses and missing

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TEST ITEM 7.1**APPLICATION OF AXIOM 5**

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 4 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students aware of the concept of collinear points.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Simple multiple choice
Cognitive process	Interpreting , problem solving.
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit : 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS
7.1 Full credit (d) 2:1 No credit Other responses and missing

TEST ITEM 7.2**APPLICATION OF AXIOM 5**

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 4 MIN TOTAL CREDIT :- 2
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DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students aware of the concept of collinear points.
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Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Closed constructed response
Cognitive process	Interpreting , problem solving.
Proficiency level	4

Credit Pattern:

Full Credit: 2

Partial Credit : 1

No Credit: 0

Description of Answer Key and Credits:

ANSWER	7.2 Full credit $PQ^2 + PR^2 - 2PQ \cdot PR = (PQ - PR)^2 = RQ^2 = 16 \text{ cm}^2$
	Partial credit if formula is correct but solution is wrong
	No credit Other responses and missing

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TEST ITEM 8.1**APPLICATIONS OF EUCLIDS GEOMETRY**

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 6
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students aware of the fundamental concepts of Geometry.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Closed constructed response
Cognitive process	Interpreting ,.
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS Full credit : Both (i)&(ii) are Mathematical Statement
 Partial credit : If any one opted as Mathematical Statement
 No credit:If both (i) &(ii) are Non Mathematical

TEST ITEM 8.2

APPLICATIONS OF EUCLIDS GEOMETRY

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 6
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students aware of the fundamental concepts of Geometry.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Open constructed response
Cognitive process	Interpreting ,.
Proficiency level	3

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS Full credit : Yes, it is conjecture .Even if we don't see the next number we can correctly guess it by observing the pattern generated. Or any relevant explanation.
Partial Credit : Yes & reason not clearly explained.
No Credit : Other responses and missing

TEST ITEM 8.3

APPLICATIONS OF EUCLIDS GEOMETRY

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 6
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students aware of the fundamental concepts of Geometry.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Open constructed response
Cognitive process	Interpreting ,.
Proficiency level	3

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS Full credit : Yes, it is an axiom. Because we do not need a proof to state its truth as it is evident in itself.

Partial Credit : Yes & reason not clearly explained.

No credit : Other responses and missing

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TEST ITEM 9.1

BENEFITS OF CNG

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 5
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		MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students relate Euclid's Geometry to real life situations.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Closed constructed response
Cognitive process	Interpreting , problem solving.
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS $X + 15 = 25$

No credit Other responses and missing

TEST ITEM 9.2

BENEFITS OF CNG

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 5MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students relate Euclid's Geometry to real life situations.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Change and relationship
Context	Scientific
Item Format	Closed constructed response
Cognitive process	Interpreting , problem solving.
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

<p>ANSWERS Full credit .X + 15 = 25 (Using Euclid’s 3rd Axiom “ things equals subtracted from equals remainder are equals’) $X + 15 - 15 = 25 - 15$ $X = 10$</p> <p>No credit Other responses and missing</p>

TEST ITEM 9.3

BENEFITS OF CNG

<p>DOMAIN :- MATHEMATICAL LITERACY</p>	<p>THEME :- INTRODUCTION TO EUCLIDS GEOMETRY</p>	<p>CLASS :- IX</p> <p>EXPECTED TIME :- 5MIN</p> <p>TOTAL CREDIT :- 2</p>
<p>DESCRIPTION OF ITEM TEXT AND IMAGE</p>	<p>LEARNING OUTCOMES :-</p>	<p>To make the students relate Euclid’s Geometry to real life situations.</p>

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Change and relationship

Context	Educational
Item Format	Open constructed response
Cognitive process	Interpreting , problem solving.
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS
Full credit Caring for the environment and looking for the other alternatives of fuel.
No credit Other responses and missing

TEST ITEM 9.4

BENEFITS OF CNG

DOMAIN :- MATHEMATICAL LITERACY	THEME :- INTRODUCTION TO EUCLIDS GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT AND IMAGE	LEARNING OUTCOMES :-	To make the students relate Euclid's Geometry to real life situations.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Change and relationship
Context	Educational
Item Format	Open constructed response`

Cognitive process	Interpreting , problem solving.
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

Full credit Compressed Natural Gas No credit Other responses and missing

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TEST ITEM 10.1 A STORY OF TWO FRIENDS

DOMAIN : - MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT	LEARNING OUTCOMES :-	To make the students aware of the Euclid's Axioms.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Reflection
Overarching Idea	Change and relationship
Context	Societal
Item Format	Simple multiple choice
Cognitive process	Interpreting
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS (b) $(x + 5)$ kg
No credit Other responses and missing

TEST ITEM 10.2 A STORY OF TWO FRIENDS

DOMAIN : - MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT	LEARNING OUTCOMES :-	To make the students aware of the Euclid's Axioms.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Reflection
Overarching Idea	Change and relationship
Context	Societal
Item Format	Closed constructed response
Cognitive process	Interpreting
Proficiency level	2

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS

Full credit Axiom 2

No credit Other responses and missing

TEST ITEM 10.3 A STORY OF TWO FRIENDS

DOMAIN :- MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT	LEARNING OUTCOMES :-	To make the students aware of the Euclid's Axioms.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Reflection
Overarching Idea	Change and relationship
Context	Societal

Item Format	Closed constructed response
Cognitive process	Interpreting
Proficiency level	3

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS

Full credit True.

No credit Other responses

TEST ITEM 10.4 A STORY OF TWO FRIENDS

DOMAIN : - MATHEMATICAL LITERACY	THEME :- EUCLID'S GEOMETRY	CLASS :- IX EXPECTED TIME :- 5 MIN TOTAL CREDIT :- 2
DESCRIPTION OF ITEM TEXT	LEARNING OUTCOMES :-	To make the students aware of the Euclid's Axioms.

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Reflection
Overarching Idea	Change and relationship
Context	Societal
Item Format	Closed constructed response
Cognitive process	Interpreting

Proficiency level	1

Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Description of Answer Key and Credits:

ANSWERS Full credit Axiom 7.

No credit Other responses and missing

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