

**Design of Question Paper**  
**Mathematics (047)**  
**Class IX**  
**S. A. –II (2012-13)**

Type of Question	Marks per question	Total no. of Questions	Total Marks
M.C.Q	1	8	8
SA-I	2	6	12
SA-II	3	10	30
LA	4	10	40
<b>TOTAL</b>		<b>34</b>	<b>90</b>

**The Question Paper will include value based question(s) to the extent of 3-5 marks**

**The Question Paper will not have any choice(s) in any of the questions.**

**Weightage**

S.No.	Unit No.	Topic	Weightage
1	II	Algebra (contd.) 3+4 [Linear equations in two variables]	16
2	III	Geometry (contd.) 1+2+4 [Quadrilaterals, Area, Circles, Constructions]	38
3	V	Mensuration 1+3+4	18
4	VI	Statistics & Probability 2+3	18
<b>Total</b>			<b>90</b>

**Sample Questions**  
**Mathematics (047)**  
**Class IX**  
**S. A. –II (2012-13)**

**M.C.Q.          1 Mark**

1. If in a quadrilateral, diagonals are equal, then it cannot be a :  
(A) Square    (B) Parallelogram    (C) Rhombus    (D) Rectangle
2. If in a sphere, volume and surface area are numerically equal, then radius will be :  
(A) 1            (B) 3            (C) 2            (D) 4

**SA-I              2 Marks**

3. In a  $\triangle ABC$ , E is the mid-point of median AD. Show that  $\text{ar} (BED) = \frac{1}{4} \text{ar} (ABC)$
4. Find the mode of 14, 25, 14, 26, 27, 16, 14, 18, 22, 25, 26, 30, 14, 25, 22.

**SA-II              3 Marks**

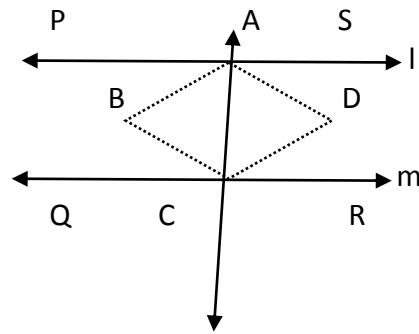
5. The slant height and base diameter of a conical tomb are 25 m and 14m respectively. Find the cost of white – washing its curved surface at the rate of.
6. In a survey, 1000 families with two children were selected randomly and the following data were recorded :

No. of girls in the family	2	1	0
No. of families	320	460	220

- Find the probability of a family, chosen at random, having (i) 2 girls (ii) 1 girl (iii) less than 1 girl.
7. Draw graphs of  $3x+2y=0$  and  $2x-3y=0$ . What is the point of intersection of the two lines representing the above equation.

**LA                – 4 Marks**

8. A 44m x 11m sheet is roled along length to form a cylinder. Find the volume of the cylinder.
9. Two parallel lines l and m are intersected by a transversal p as shown in the figure. Show that the quadrilateral formed by the bisectors of interior angles is a rectangle.



10. Cost of 7 pens and 8 pencils is Rs. 87 and cost of 6 pens and 4 pencils is Rs. 66. Write linear equations representing the above data and draw its graph. Also find the cost of 1 pen and 1 pencil from the graph.

**ANSWER KEY**

- 1. (C) 1M
- 2. (B) 1M
- 3. Median of a triangle divides it into two triangles of equal area

In  $\triangle ABC$ , AD  $\triangle$  median

$\therefore \text{ar}(\triangle ABD) = \frac{1}{2} \text{ar}(\triangle ABC)$  (i)

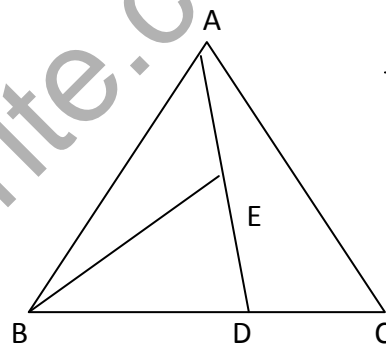
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In  $\triangle ABD$ , BE is median

$\therefore \text{ar}(\triangle BED) = \frac{1}{2} \text{ar}(\triangle ABD)$

...

$= \frac{1}{4} \text{ar}(\triangle ABC)$  using (i)



$\frac{1}{2} M$

Fig  $\frac{1}{2} M$

$\frac{1}{2} M$

- 4. Number 14 occurs most frequently i.e. 4 times 1 M
- so mode = 14 1 M

5. l = slant height = 25 m, r = radius = 7 m

Area of curved surface of conical tomb =  $\pi rl$   $\frac{1}{2} M$

$= \frac{22}{7} \times 7 \times 25$

$= 550 \text{ m}^2$

Cost of white wash @ Rs. 410 per 100  $\text{m}^2 = 550 \times \frac{410}{100}$  1 M

$= \text{Rs. } 2255/-$   $\frac{1}{2} M$

2

6. (i) Prob of 2 girls in the family =  $p(2) = \frac{320}{1000} = \frac{8}{25}$  1 M

Prob of 1 girl in the family =  $p(1) = \frac{460}{1000} = \frac{23}{50}$  1 M

Prob of less than 1 girls in the family =  $p(0) = \frac{220}{1000} = \frac{11}{50}$  1 M

7.  $3x + 2y = 0$

$Y = -\frac{3x}{2}$

x	0	2	-2
Y	0	-3	3

Graph

$2x - 3y = 0$  1 M

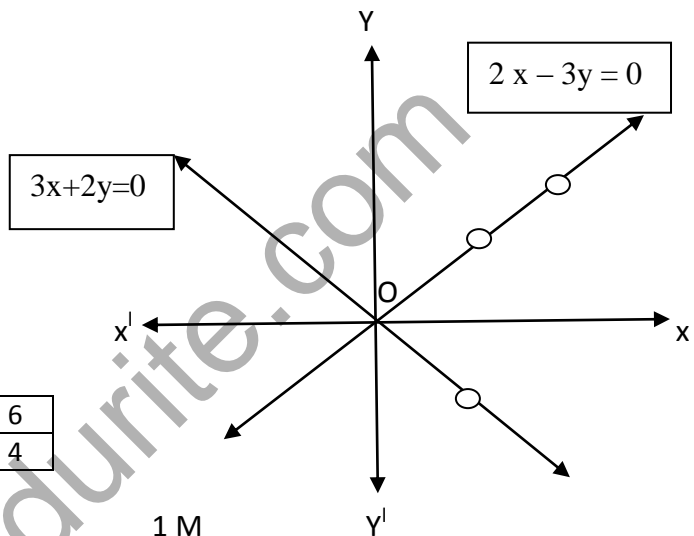
$Y = \frac{2x}{3}$

x	0	3	6
Y	0	2	4

Graph

1 M

Point of intersection (0, 0)



8. Area of sheet =  $44 \times 11 \text{ m}^2$   
 Height of cylinder = length of sheet = 44 m 1 M

Area of cylinder =  $2 \pi r h = 2 \cdot \frac{22}{7} \cdot r \cdot 44 = 44 \times 11$  1 M

$r = \frac{7}{4} \text{ m}$  ½ M

Vol. of cylinder =  $\pi r^2 h$   
 =  $\frac{22}{7} \cdot \frac{7}{4} \cdot \frac{7}{4} \cdot 44$  ½ M

=  $\frac{1547}{2} \text{ m}^3$   
 =  $773.5 \text{ m}^3$  1 M

9.  $\angle PAC = \angle ACR$  (alternate angle)

$\frac{1}{2} \angle PAC = \frac{1}{2} \angle ACR$

$\Rightarrow \angle BAC = \angle ACD$  ½ M

But they are alternate angles for lines AB and DC with AC as transversal

So  $AB \parallel DC$  1 M

Similarly  $BC \parallel AD$   $\frac{1}{2}$  M

∴ ABCD is a parallelogram

Also  $\angle PAC + \angle CAS = 180^\circ$  (linear pair)

$$\frac{1}{2} \angle PAC + \frac{1}{2} \angle CAS = 90^\circ$$
 1 M

$$\angle BAC + \angle CAD = 90^\circ$$

$$\angle BAD = 90^\circ$$
  $\frac{1}{2}$  M

ABCD is a parallelogram with  $\angle A = 90^\circ$

∴ ABCD is a rectangle  $\frac{1}{2}$  M

10. Let cost of 1 pen = Rs. x

cost of 1 pencil = Rs. y

$$7x + 8y = 87$$

$$4y = 66 \text{ or } 2x + 3y = 33$$

$$7x + 8y = 87$$

$$Y = \frac{87 - 7x}{8}$$

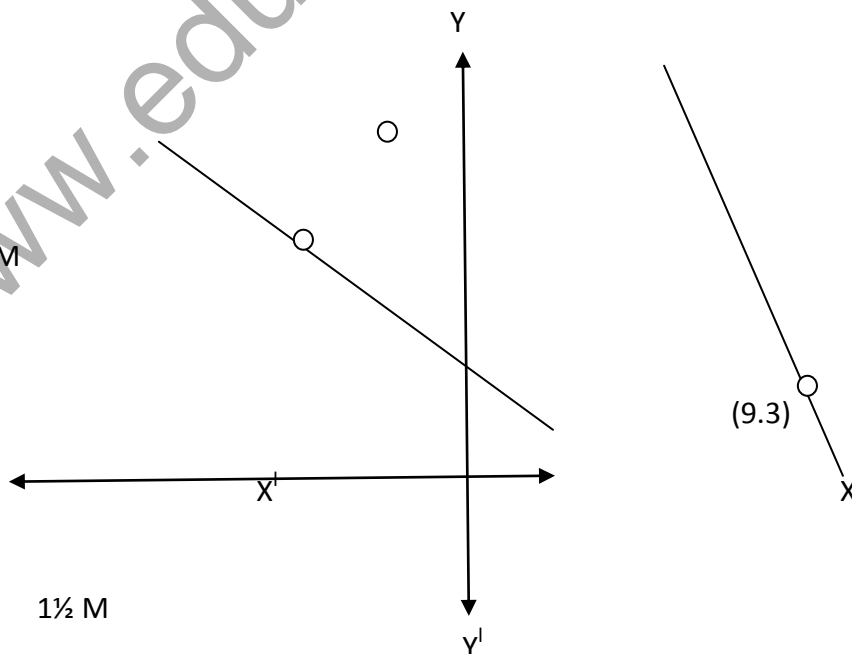
x	3	9
Y	7	3

Graph  $1 \frac{1}{2}$  M

$$3x + 2y = 33$$

$$y = \frac{33 - 3x}{2}$$

x	9	5
Y	3	9



Point of intersection is (9, 3) i.e.  $1 \frac{1}{2}$  M

Cost of 1 Pen = Rs. 9

Cost of 1 Pencil = Rs. 3  $\frac{1}{2}$  M

## VALUE BASED QUESTION

4 Marks

Shimpi, a class IX student received cash award of Rs. 10,000/- (Ten thousand) in the singing competition. Her father advised her to made a budget plan for spending this amount. She made following plan :

Sl. No.	Head	Amount
1	Donation in temple	200
2	Tuition fee to needy child	100
3	Welfare of senior citizens	500
4	Welfare of street children	800
5	Saving in bank	4000
6	Books for family library	2000
7	Picnic for family	1000
8	Gift to grand parents	1100
9	Tea party to friends	300
	<b>Total</b>	<b>10000</b>

Make a pie chart for the above data.

From above answer the following question :

1. Which mathematical concepts have been covered in this?
2. How will you rate her budget plan? In your opinion which head has been given (i) more than it deserved and (ii) less than it deserved?
3. Which values are depicted in her plan?

Marking scheme Value Based Question

Sl. No.	Head	Amount	Central angle
1	Donation in temple	200	7.2
2	Tuition fee to needy child	100	3.6
3	Welfare of Senior Citizen	500	18.0
4	Welfare of street children	800	28.8
5	Saving in bank	4000	144.0
6	Books for family library	2000	72.0
7	Picnic for family	1000	36.0
8	Gift to grand parents	1100	39.6
9	Tea party to friends	300	10.8
	<b>Total</b>	<b>10000</b>	<b>360.0</b>

