SET - A

Eng. Medium 9th GSEB Batch :	**MAHESH TUTORIALS** **SUBJECT : Maths** **Group - 1** **Chapter # 1, 2, 3, 4, 5, 6, 7, 12, 15** **Question Paper**	**Test -** Date: Time: Marks :

CHAPTER : 1

Q : 1 **MCQs : [1 Mark]** **01**

1. **_____ is a rationalizing factor of 3 + $\sqrt{7}$**

(a) $\sqrt{3}$ - 7 (b) $\sqrt{3}-\sqrt{7}$ (c) $\sqrt{7}+\sqrt{3}$ (d) $3-\sqrt{7}$

Q : 2 **Solve the following sums : [2 Marks Each]** **06**

2. Find five rational numbers between $\frac{3}{5}$ and $\frac{4}{5}$.

3. Write the following in decimal form and say what kind of decimal expansion each has : $4\frac{1}{8}$

4. Show how $\sqrt{5}$ can be represented on the number line.

5. Express the following in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$

$0.\overline{001}$

Q : 3 **Solve the following sums : [3 Marks]** **03**

6. Simplify each of the following expressions :

(i) $\left(\sqrt{5}+\sqrt{2}\right)^2$ (ii) $\left(\sqrt{5}-\sqrt{2}\right)\left(\sqrt{5}+\sqrt{2}\right)$

Rationalise the denominators of the following :

(iii) $\frac{1}{\sqrt{7}-2}$

CHAPTER : 2

Q : 1 **Multiple Choice Questions : [1 Mark Each]** **02**

1. **$(1.3)^3 - (0.6)^3 - (0.7)^3$ = _____**

(a) -1.638 (b) -16.38 (c) 1.638 (d) 16.38

2. **If a = b = c then $a^3 + b^3 + c^3 - 3abc$ = _____**

(a) a^3 (b) $2a^3$ (c) $3a^3$ (d) 0

Q : 2 **Solve the following sums : [2 Marks Each]** **08**

3. Verify whether the following are zeroes of the polynomial, indicated against them.
$p(x) = (x + 1)(x - 2)$, $x = -1, 2$

4. Find the value of k, if $x - 1$ is a factor of $p(x)$ in each of the following cases :
$p(x) = kx^2 - 3x + k$

5. Factorise : $x^3 + 13x^2 + 32x + 20$

6. Write the following cubes in expanded form : $(2a - 3b)^3$

CHAPTER : 3

Q : 1 **Solve the following sums : [1 Marks Each]** **02**

1. The co-ordinate of point which lies on Y-axis at a distance of 5 units in the negative direction of Y-axis is :

2. If the x-co-ordinate of a point is negative, it can lie in which quadrant ?

Q : 3 **Solve the following sums : [4 Marks Each]** **08**

3. See figure, and write the following :

(i) The coordinates of B.

(ii) The coordinates of C.

(iii) The point identified by the coordinates (– 3, – 5).

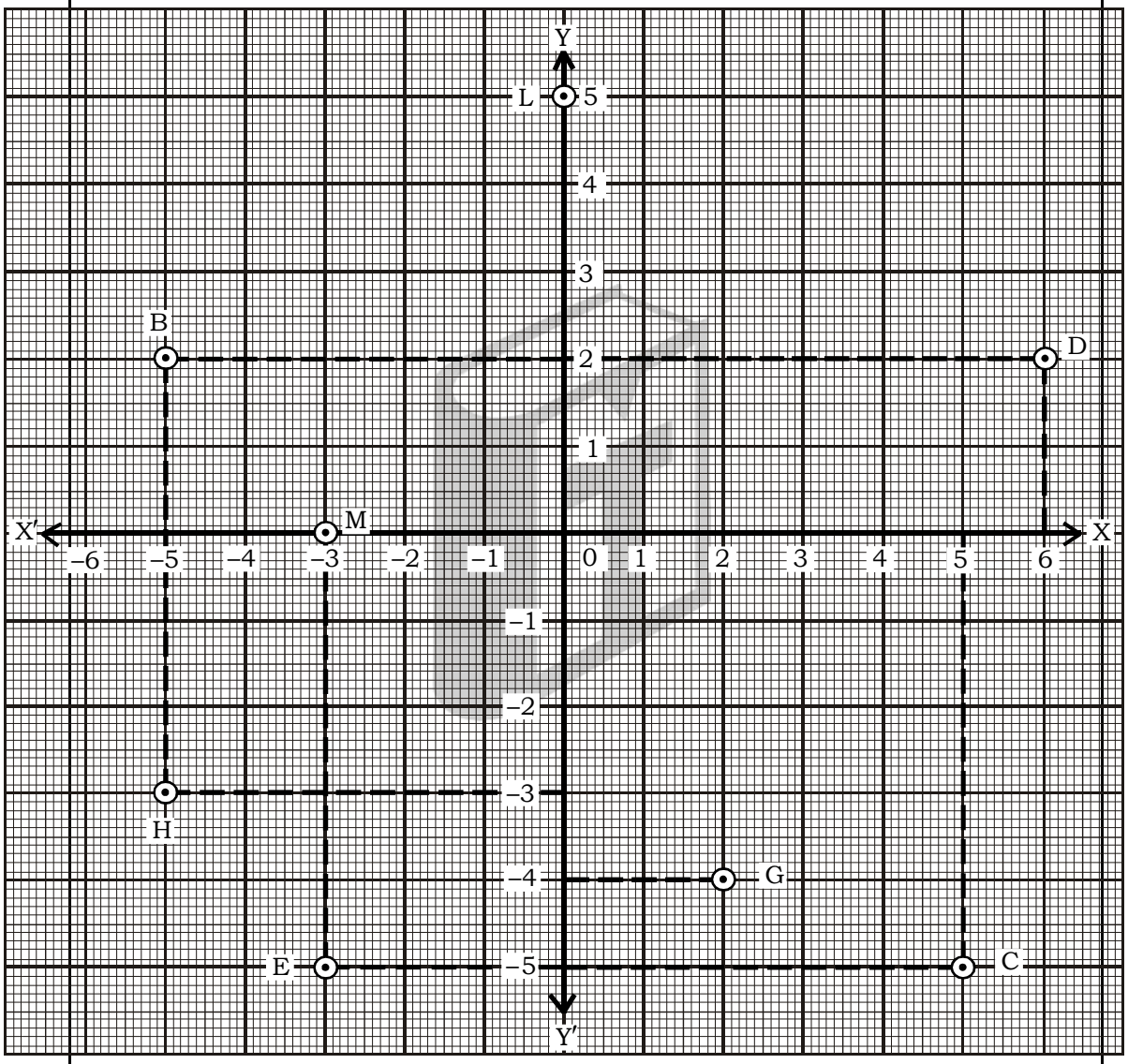
(iv) The point identified by the coordinates (2, – 4).

(v) The abscissa of the point D.

(vi) The ordinate of the point H.

(vii) The coordinates of point L.

(viii) The coordinates of the point M.



4. In which quadrant or on which axis do each of the points (–2, 4), (3, –1), (–1, 0), (1, 2) and (–3, –5) lie? Verify your answer by locating them on the Cartesian plane.

CHAPTER : 4

Q : 1 **Mutiple Choice Questions :** **[1 Mark]** **01**

1. **If the equation is $F = \left(\frac{9}{5}\right) C + 32$, then C = _____**

(a) 5F - 160 (b) $\frac{5}{9}(F - 160)$ (c) $\frac{5}{9}F - 32$ (d) $\frac{5}{9}(F - 32)$

Q : 2 **Solve the following sums : [2 Mark]** **02**

2. Find the value of k if $x = 2$, $y = 1$ is a solution of the equation $2x + 3y = k$.

Q : 3 **Solve the following sums : [3 Mark]** **03**

3. The taxi fare in a city is as follows : For the first kilometre, the fare is Rs. 8 and for the subsequent distance it is Rs. 5 per km. Taking the distance covered as x km and total fare as Rs. y, write a linear equation for this information, and draw its graph.

Q : 4 **Solve the following sums : [4 Mark]** **04**

4. Yamini and Fatima, two students of Class IX of a school, together contributed Rs. 100 towards the Prime Minister's Relief Fund to help the earthquake victims. Write a linear equation which this data satisfies. (You may take their contributions as Rs. x and Rs. y). Draw the graph of the same.

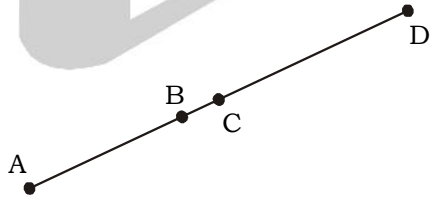
CHAPTER : 5

Q : 1 **Solve the following sums : [1 Marks Each]** **02**

1. John is of the same age as Mohan. Ram is also of the same age as Mohan.
   State the Euclid's axiom that illustrates the relative ages of John and Ram.
2. How would you rewrite Euclid's fifth postulate so that it would be easier to understand?

Q : 2 **Solve the following sums : [2 Marks Each]** **08**

3. If a point C lies between two points A and B such that AC = BC, then prove that AC = $\frac{1}{2}$AB. Explain by drawing the figure.
4. If a point C lies between two points A and B such that AC = BC, point C is called a mid-point of line segment AB. Prove that every line segment has one and only one mid-point.
5. In Figure, if AC = BD, then prove that AB = CD.



6. It is known that x + y = 10 and that x = z. Show that z + y = 10?

CHAPTER : 6

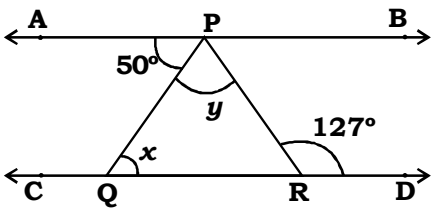
Q : 1 **Multiple Choice Questions : [1 Mark]** **01**

1. If two angle forming a linear pair have measures (6y +30) and 4y then y = ...

(a) 30 (b) 15 (c) 60 (d) 90

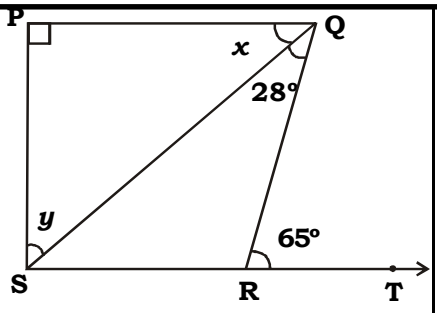
Q : 2 **Solve the following sums : [2 Mark]** **02**

2. In figure, if AB || CD, ∠APQ = 50° and ∠ PRD = 127°, find x and y.



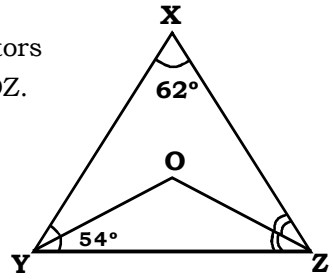
Q : 3 **Solve the following sums : [3 Mark]** **03**

3. In figure, If PQ ⊥ PS, PQ || SR, ∠SQR = 28° and ∠QRT = 65°, then find the values of x and y.



Q : 4 **Solve the following sums : [4 Mark]** **04**

4. In figure, ∠X = 62°, ∠XYZ = 54°. If YO and ZO are the bisectors of ∠XYZ and ∠XZY respectively of ΔXYZ, find ∠OZY and ∠YOZ.



CHAPTER : 7

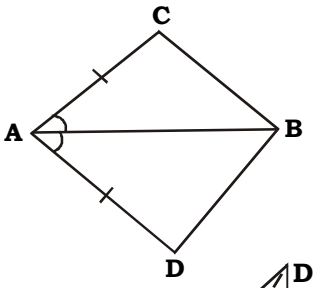
Q : 1 **Multiplce Choice Questions : [1 Mark]** **01**

1. **_____ criterion does not imply congruence.**

(a) AAS (b) SSA (c) ASA (d) SAS

Q : 2 **Solve the following sums : [2 Mark]** **02**

2. In quadrilateral ACBD, AC = AD and AB bisects ∠A (see figure). Show that ΔABC ≅ ΔABD. What can you say about BC and BD ?

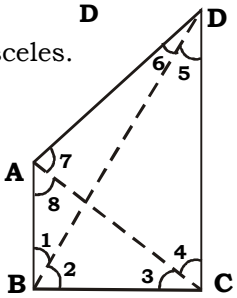


Q : 3 **Solve the following sums : [3 Mark]** **03**

3. BE and CF are two equal altitudes of a triangle ABC. Using RHS congruence rule, prove that the triangle ABC is isosceles.

Q : 4 **Solve the following sums : [4 Mark]** **04**

4. AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD (see figure). Show that ∠ A > ∠ C and ∠ B > ∠ D.



CHAPTER : 12

Q : 1 **Multiplce Choice Questions : [1 Mark]** **01**

1. **The area of an equilateral triangle with each side measuring 10 cm is _____cm².**

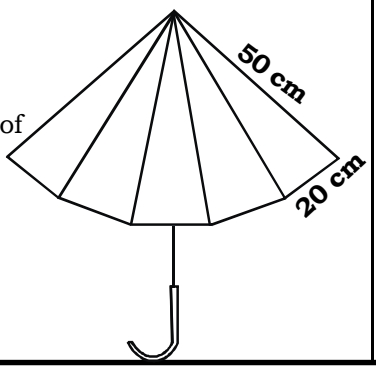
(a) $\frac{5\sqrt{3}}{2}$ (b) $25\sqrt{3}$ (c) $5\sqrt{3}$ (d) $3\sqrt{5}$

Q : 2 **Solve the following sums : [2 Marks]** **02**

2. Find the area of a triangle two sides of which are 18cm and 10cm and the perimeter is 42cm.

Q : 3 **Solve the following sums : [3 Mark]** **03**

3. An umbrella is made by stitching 10 triangular pieces of cloth of two different colours (See figure), each piece measuring 20cm, 50cm, and 50cm. How much cloth of each colour is required for the umbrella ?



Q : 4 **Solve the following sums : [4 Mark]** **04**

4. A field is in the shape of a trapezium whose parallel sides are 25m and 10m. The non-parallel sides are 14m and 13m. Find the area of the field.

CHAPTER : 15

Q : 1 **MCQs : [1 Marks Each]** **02**

1. Probability of having 5 sundays in the month of January is _____.

(a) $\frac{2}{7}$ (b) $\frac{3}{7}$ (c) $\frac{5}{7}$ (d) $\frac{1}{7}$

2. The probability of getting number 5 on a balanced die is .....

(a) $\frac{1}{3}$ (b) $\frac{1}{4}$ (c) $\frac{1}{5}$ (d) $\frac{1}{6}$

Q : 2 **Solve the following sums : [2 Marks Each]** **04**

3. (i) Three coins are tossed simultaneously 200 times with the following frequencies of different outcomes.

Outcome	**3 heads**	**2 heads**	**1 head**	**No head**
Frequency	**23**	**72**	**77**	**28**

If the three coins are simultaneously tossed again, compute the probability of 2 heads coming up.

3. (ii) Eleven bags of wheat flour, each marked 5 kg, actually contained the following weights of flour (in kg) :

4.97, 5.05, 5.08, 5.03, 5.00, 5.06, 5.08, 4.98, 5.04, 5.07, 5.00

Find the probability that any of these bags chosen at random contains more than 5 kg of flour.

4. A teacher analyses the performance of two sections of students in a mathematics test of 100 marks given in the following table.

Marks	**Number of students**
0 - 20	**7**
20 - 30	**10**
30 - 40	**10**
40 - 50	**20**
50 - 60	**20**
60 - 70	**15**
70 and above	**8**
Total	**90**

(i) Find the probability that a student obtained less than 20% in the mathematics test.

(ii) Find the probability that a student obtained marks 60 or above.

Q : 3 **Solve the following sums : [4 Marks]** **04**

5. An organisation selected 2400 families at random and surveyed them to determine a relationship between income level and the number of vehicles in a family. The information gathered is listed in the table below.

Monthly income (in Rs)	Vehicles per family			
	0	1	2	Above 2
Less than 7000	10	160	25	0
7000 – 10000	0	305	27	2
10000 – 13000	1	535	29	1
13000 – 16000	2	469	59	25
16000 or more	1	579	82	88

Suppose a family is chosen. Find the probability that the family chosen is

(i) earning Rs 10000 – 13000 per month and owning exactly 2 vehicles.

(ii) earning Rs 16000 or more per month and owning exactly 1 vehicle.

(iii) earning less than Rs. 7000 per month and does not own any vehicle.

(iv) earning Rs. 13000 - 16000 per month and owning more than 2 vehicle.

★★★★ ***Best of Luck*** ★★★★

SET - A

Eng. Medium 9th GSEB Batch :	**MAHESH TUTORIALS** **SUBJECT : Maths** **Group - 1** **Chapter # 1, 2, 3, 4, 5, 6, 7, 12, 15** **Model Answer Paper**	**Test -** Date: Time: 3 Hrs Marks : 100

CHAPTER : 1

Q : 1 **MCQs : [1 Mark]** **01**

1. (d) $3-\sqrt{7}$

Q : 2 **Solve the following sums : [2 Marks Each]** **06**

2. Since we require 5 rational numbers between $\frac{3}{5}$ and $\frac{4}{5}$, So we write ½

$\frac{3}{5} = \frac{3}{5} \times \frac{6}{6} = \frac{18}{30}$ and $\frac{4}{5} = \frac{4}{5} \times \frac{6}{6} = \frac{24}{30}$ ½

Also $18 < 19 < 20 < 21 < 22 < 23 < 24$

$\frac{18}{30} < \frac{19}{30} < \frac{20}{30} < \frac{21}{30} < \frac{22}{30} < \frac{23}{30} < \frac{24}{30}$ ½

Hence 5 rational number between $\frac{3}{5}$ and $\frac{4}{5}$ are $\frac{19}{30}, \frac{20}{30}, \frac{21}{30}, \frac{22}{30}$ and $\frac{23}{30}$. ½

3. $4\frac{1}{8} = \frac{33}{8}$ ½

$= \frac{33 \times 125}{8 \times 125}$ ½

$= \frac{4125}{1000}$ ½

= 4.125, terminating decimal ½

4. $\left(\sqrt{5}\right)^2 = 2^2 + 1^2$

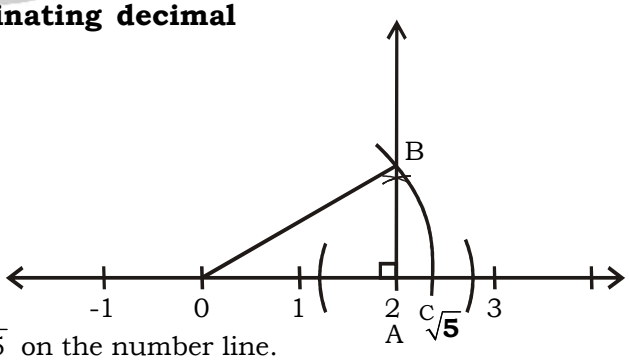
We construct right angled ΔOAB, ½

right angled at A such that

OA = 2 and AB = 1 unit. ½

∴ By Pythagoras Theorem,

$OB = \sqrt{OA^2 + AB^2} = \sqrt{2^2 + 1^2} = \sqrt{5}$ ½



Now, cut off a length OC = OB = $\sqrt{5}$ on the number line. ½

∴ Point C represents the irrational number $\sqrt{5}$.

5. Let $x = 0.\overline{001} = 0.001001001.....$ ---------- (1) ½

Multiplying both sides by 1000, we get

$1000x = 1.001001001....$ ---------- (2) ½

Subtracting (1) from (2), we get

$1000x - x = (1.001001001....) - (0.001001001....)$

$999x = 1$

$\therefore x = \frac{1}{999}$ ½

$\therefore \quad \mathbf{0.\overline{001}} = \mathbf{\frac{1}{999}}$ ½

Q : 3 Solve the following sums : [3 Mark] **03**

6. (i) $\left(\sqrt{5}+\sqrt{2}\right)^2 = \left(\sqrt{5}\right)^2 + 2\left(\sqrt{5}\right)\left(\sqrt{2}\right) + \left(\sqrt{2}\right)^2$ ½

$= 5 + 2\sqrt{10} + 2$

$= \mathbf{7 + 2\sqrt{10}}$ ½

(ii) $\left(\sqrt{5}-\sqrt{2}\right)\left(\sqrt{5}+\sqrt{2}\right) = \left(\sqrt{5}\right)^2 - \left(\sqrt{2}\right)^2$ ½

$= 5 - 2$ ½

$= 3$ ½

(iii) $\frac{1}{\sqrt{7}-2} = \frac{1}{\sqrt{7}-2} \times \frac{\sqrt{7}+2}{\sqrt{7}+2} = \frac{\sqrt{7}+2}{\left(\sqrt{7}\right)^2-(2)^2} = \frac{\sqrt{7}+2}{7-4} = \mathbf{\frac{\sqrt{7}+2}{3}}$ ½ ½

CHAPTER : 2

Q : 1 Multiple Choice Questions : [1 Mark Each] **02**

1. (c) 1.638 1

2. (d) 0 1

Q : 2 Solve the following sums : [2 Marks Each] **08**

3. $p(x) = (x + 1)(x - 2),\ x = -1, 2$

$p(x) = (x + 1)(x - 2)\ ;\ x = -1, 2$ ½

$\therefore \quad p(-1) = (-1 + 1)(-1 - 2)1$

$= (0)(-3)$ ½

$= 0$

$\therefore$ -1 is a zero of $p(x)$ ½

Also, $p(2) = (2 + 1)(2 - 2) = 3(0) = 0$ ½

$\therefore$ 2 is a zero of $p(x)$

4. Since, $(x - 1)$ is a factor of $p(x) = kx^2 - 3x + k$ ½

$\therefore p(1) = 0$

$\therefore k(1)^2 - 3(1) + k = 0$

$\therefore k - 3 + k = 0$ ½

$\therefore 2k - 3 = 0$

$\therefore 2k = 3$ ½

$\therefore \quad k = \mathbf{\frac{3}{2}}$ ½

5. Let $p(x) = x^3 + 13x^2 + 32x + 20$

The constant term is 20.

$\therefore$ The possible factors are $\pm 1, \pm 2, \pm 4, \pm 5, \pm 10, \pm 20$

Now, $p(-1) = (-1)^3 + 13(-1)^2 + 32(-1) + 20$

$= -1 + 13 - 32 + 20$ ½

$= 0$

$\therefore$ $(x + 1)$ is a factor of $p(x)$.

To obtain the second factor, divide p(x) by $(x + 1)$

$$x^2 + 12x + 20$$
$$x + 1 \overline{)x^3 + 13x^2 + 32x + 20}$$
$$x^3 + x^2$$
$$- \quad -$$
$$12x^2 + 32x$$
$$12x^2 + 12x$$
$$- \quad -$$
$$20x + 20$$
$$20x + 20$$
$$- \quad -$$
$$0$$

½ ½ ½ 1

$\therefore$ Second factor $= x^2 + 12x + 20$ ½
$= x^2 + 10x + 2x + 5$ ½
$= x(x + 10) + 2(x + 10)$
$= (x + 10)(x + 2)$

$\therefore p(x) = (x + 1)(x + 10)(x + 2)$

$x^3 + 13x^2 + 32x + 20 = (x + 1)(x + 10)(x + 2)$

6. $(2a - 3b)^3 = (2a)^3 - 3(2a)(3b)(2a - 3b) - (3b)^3$ [$\because (a - b)^3 = (a)^3 - 3ab(a - b) - b^3$] ½
$= 8a^3 - 18ab(2a - 3b) - 27b^3$ ½
$= 8a^3 - 36a^2b + 54ab^2 - 27b^3$ 1

CHAPTER : 3

Q : 1 Solve the following sums : [1 Marks Each] **02**

1. Since the point lies at a distance of 5 units in the negative direction of Y-axis so, ½
y-co-ordinate of the point is – 5 and its x-co-ordinate is 0.
y Co-ordinate of required point is (0, – 5). ½

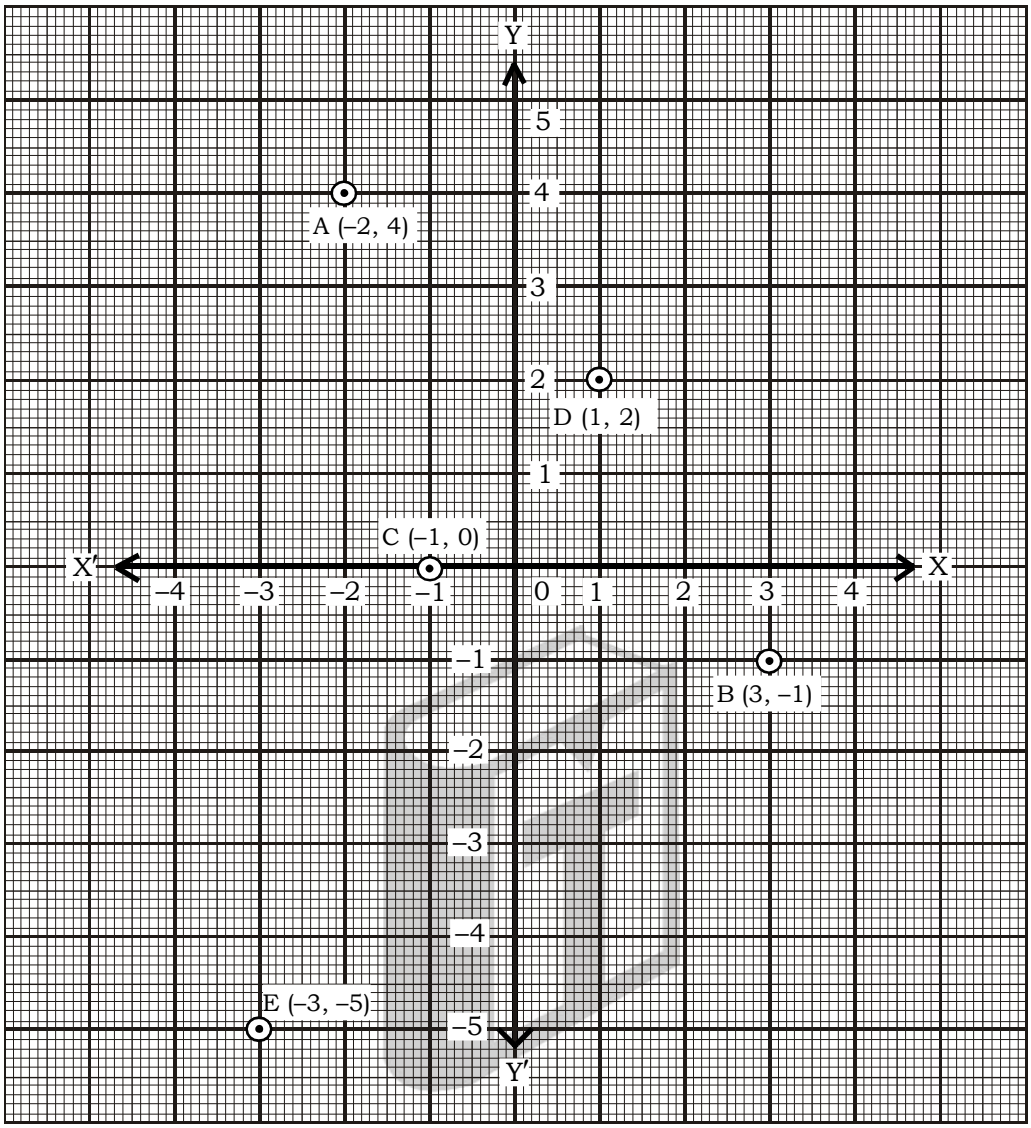
2. II or III quadrant. 1

Q : 3 Solve the following sums : [4 Marks Each] **08**

3. Clearly, from the figure :
(i) The coordinates of B are (–5, 2). ½
(ii) The coordinates of C are (5, –5). ½
(iii) The coordinates (–3, –5) are identified by the point E. ½
(iv) The coordinates (–2, –4) are identified by the point G. ½
(v) The abscissa of the point D is 6. ½
(vi) The ordinate of the point H is – 3. ½
(vii) The coordinates of the point L are (0, 5). ½
(viii) The coordinates of the point M are (–3, 0). ½

4. (i) In the point (–2, 4), abscissa is negative and ordinate is positive. So, it lies in the second quadrant.
(ii) In the point (3, –1), abscissa is positive and ordinate is negative. So, it lies in the fourth quadrant. ½
(iii) The point (–1, 0) lies on the negative x - axis.
(iv) In the point (1, 2) abscissa and ordinate are positive, so it lies in the first quadrant. ½
(v) In the point (–3, – 5) abscissa and ordinate are negative. Therefore, it lies in the third quadrant. ½
Let us locate these points on the cartesian plane. Plot the points (–2, 4), (3, –1)

(–1, 0) and (1, 2) as shown.



2

These points are respectively represented by A, B, C, D and E, which clearly verify their location. ½

CHAPTER : 4

Q : 1 **Mutiple Choice Questions : [1 Mark]** **01**

1. (b) $\frac{1}{9}(5F - 160)$ 1

Q : 2 **Solve the following sums : [2 Mark]** **02**

2. If $x = 2$, $y = 1$ is a solution of the equation $2x + 3y = k$, then these values will satisfy the equation. ½

$\therefore\ (2 \times 2) + (3 \times 1) = k \Rightarrow k = 4 + 3 = 7.$ ½ ½

$\therefore\ k = 7$

Q : 3 **Solve the following sums : [3 Mark]** **03**

3. The taxi fare in a city is as follows : For the first kilometre, the fare is Rs. 8 and for the subsequent distance it is Rs. 5 per km. Taking the distance covered as x km and total fare as Rs. y, write a linear equation for this information, and draw its graph.

Taxi fare for first km = Rs. 8

Taxi fare for the subsequent km = Rs. 5

Total fare = Rs. y ½

Total distance = x km

The linear equation for the above information is given by :

$y = 8 \times 1 + 5(x - 1)$

$\therefore \quad y = 8 + 5x - 5$

$\therefore \quad y = 5x + 3$

$\Rightarrow \quad 5x - y + 3 = 0$

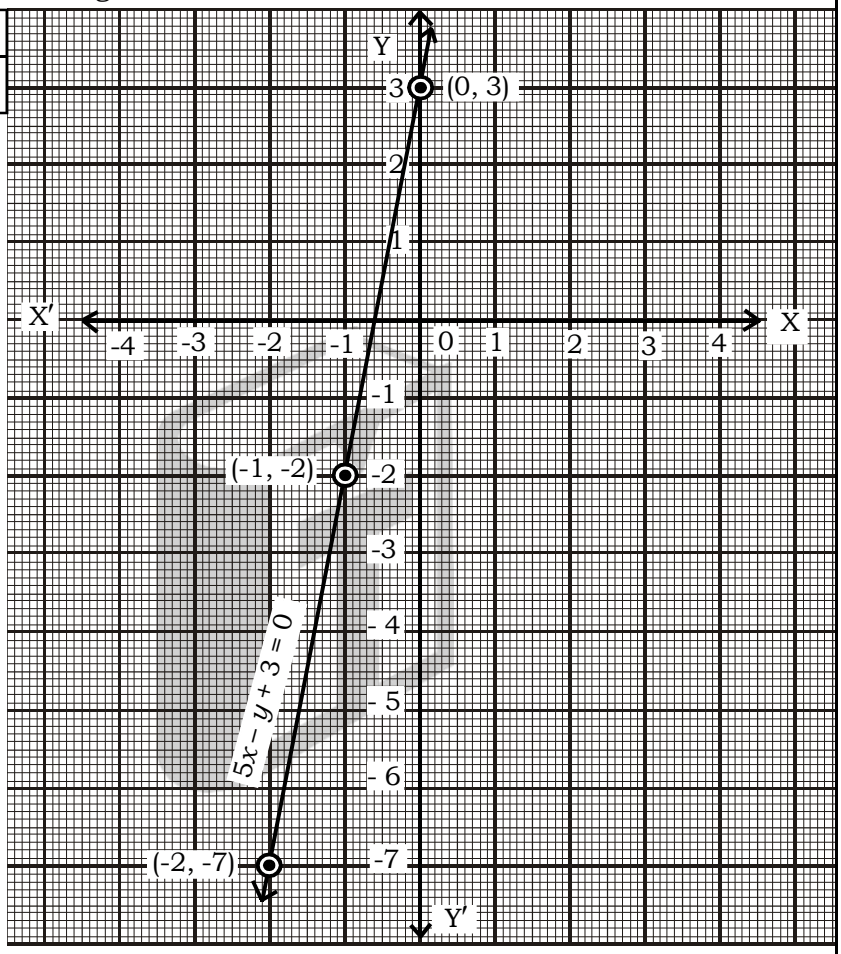
When $x = 0$, $y = 5 \times 0 + 3 = 0 + 3 = 3$

When $x = -1$, $y = 5 \times (-1) + 3 = -5 + 3 = -2$

When $x = -2$, $y = 5 \times (-2) + 3 = -10 + 3 = -7$

Thus, we have the following table :

x	0	– 1	– 2
y	3	– 2	– 7



½

1 ½

Plotting the points (0, 3), (– 1, – 2) and (–2, –7) on the graph paper and drawing a line joining them, we obtain the required graph.

Q : 4 **Solve the following sums : [4 Mark]** **04**

4. Let Yamini and Fatima contributed Rs. x and Rs. y towards the P.M.'s Relief Fund totally Rs. 100. ½

$\therefore$ The linear equation using the above data is $x + y = 100$. i.e., $y = 100 - x$.

To draw its graph :

When $x = 0$, we have $y = 100 - 0 = 100$

When $x = 100$, we have $y = 100 - 100 = 0$ ½

When $x = 50$, we have $y = 100 - 50 = 50$

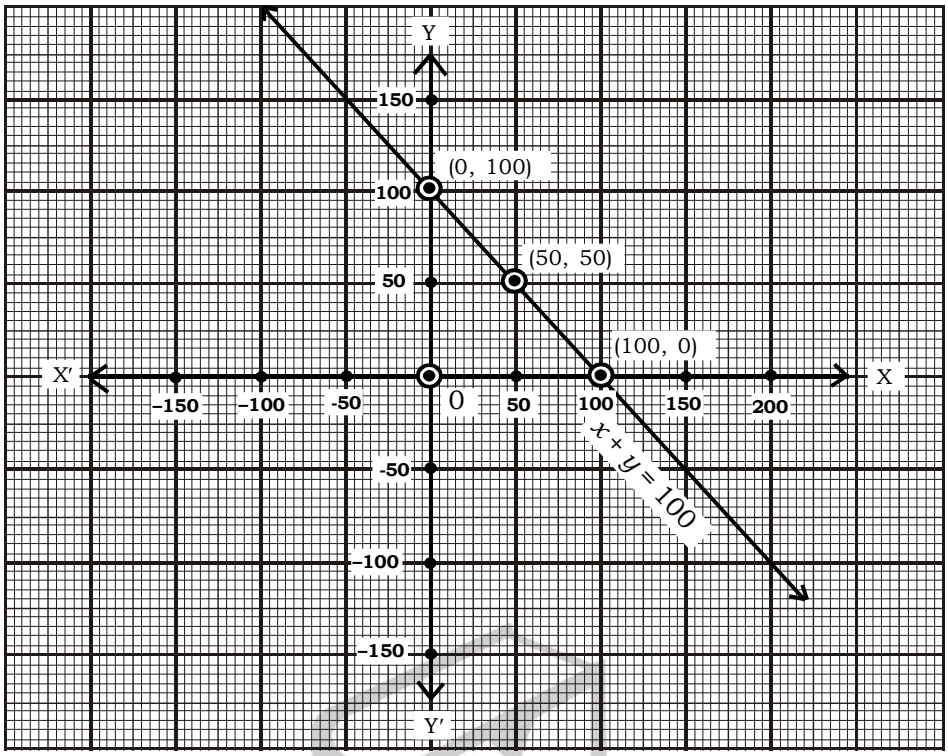
The table for these values is as under : ½

x	0	100	50
y	100	0	50

½

Plotting the points (0, 100), (100, 0) and (50, 50) on the graph paper and drawing

a line joining them, we obtain the graph of the line $x + y = 100$ as shown.



2

CHAPTER : 5

Q : 1 **Solve the following sums : [1 Marks Each]** **02**

1. Things Which are equal to the same thing are equal to one another. 1

2. The axiom asserts two facts :

(i) There is a line through P which is parallel to l and ½

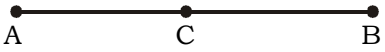
(ii) there is only one such line. ½

Q : 2 **Solve the following sums : [2 Marks Each]** **08**

3. We have a point C lying between two points A and B such that AC = BC.

Adding AC on both sides, we have ½

$AC + AC = AC + BC$

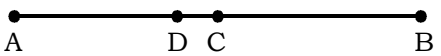


$\therefore \quad 2AC = AB$ ½

$\therefore \quad AC = \frac{1}{2}AB.$ [$\because$ AC + CB coincides with AB] ½ ½

4. If possible, let D be another mid-point of AB.

$\therefore \quad AD = DB$ ..... (1)



But it is given that C is the mid-point of AB. ½

$\therefore \quad AC = CB$ ..... (2) ½

Subtracting (1) from (2), we get

$AC - AD = CB - DB \Rightarrow DC = -DC$ ½

$2DC = 0 \Rightarrow DC = 0$

$\therefore$ C and D coincides.

Thus every line segment has one and only one mid-point. ½

5. $AC = BD$ ..... (1) (Given)

Also $AC = AB + BC$ ..... (2) (Point B lies between A and C) ½

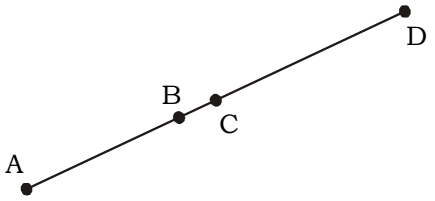
and, $BD = BC + CD$ ..... (3) (Point C lies between B and D)

Substituting for AC and BD from (2) and (3) in (1), we get ½

AB + BC = BC + CD ½

∴ AB + BC – BC = BC + CD – BC ½

∴ AB = CD.



6. x = z ...(i) [Given] ½

y = y ...(ii) ½

If equals are added to equals, the wholes are equal. ½

x + y = z + y ...(iii) [From (i) and (ii)] ½

But x + y =10 [Given] ½

10 = z + y [Things which are equal to the same thing are equal to one another] ½

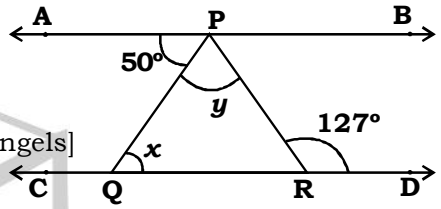
CHAPTER : 6

Q : 1 Multiple Choice Questions : [1 Mark] 01

1. (b) 15 1

Q : 2 Solve the following sums : [2 Mark] 02

2. AB || CD and transversal PQ intersects them at P and Q respectively.



∴ ∠PQR = ∠APQ [Alternate angels] ½

∴ x = 50 ½

∵ AB || CD and transversal PR intersects them at P and R respectively.

∴ ∠APR = ∠PRD [Alternate angles]

∴ ∠APQ + ∠QPR = 127° [∵ ∠PRD = 127°]

∴ 50 + y = 127 [∵ ∠APQ = 50°] ½

∴ y = 127 – 50 = 77

Hence x = 50 and y = 77. ½

Q : 3 Solve the following sums : [3 Mark] 03

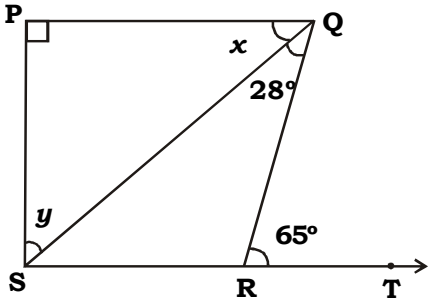
3. PQ || SR and QR is a transversal line.

∠PQR = ∠QRT (Alternate interior angles) ½

x + 28 = 65

x = 65 – 28 ½

x = 37



Using angle sum property for ΔSPQ, we obtain ½

∠SPQ + x + y = 180

90 + 37 + y = 180 ½

y = 180 – 127

y = 53 ½

∴ x = 37 and y = 53

Q : 4 Solve the following sums : [4 Mark] 04

4. Consider ΔXYZ,

∠YXZ + ∠XYZ + ∠XZY = 180° [Angle sum property of a triangle] ½

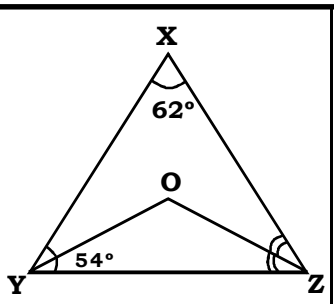
∴ 62° + 54° + ∠XZY = 180° [∵ ∠YXZ = 62°, ∠XYZ = 54°]

∴ ∠XZY = 180° – 62° – 54° = 64°

Since YO and ZO are bisectors of ∠XYZ and ∠XZY. Therefore ½

$$\angle OYZ = \frac{1}{2} \times \angle XYZ = \frac{1}{2} \times 54^\circ = 27^\circ$$ ½

and $\angle OZY = \frac{1}{2} \times \angle XZY = \frac{1}{2} \times 64° = 32°$ ½



In ΔOYZ, we have ½

$\angle YOZ + \angle OYZ + \angle OZY = 180°$ [Angle sum property] ½

$\therefore \angle YOZ + 27° + 32° = 180°$ ½

$\therefore \angle YOZ = 180° - 27° - 32° = 121°$ ½

Hence, $\angle OZY = 32°$ and $\angle YOZ = 121°$

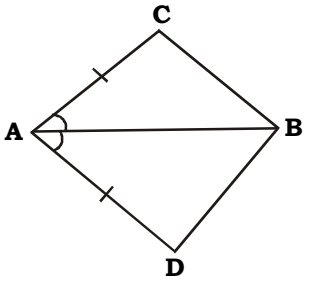
CHAPTER : 7

Q : 1 **Multiplce Choice Questions : [1 Mark]** **01**

1. (b) SSA

Q : 2 **Solve the following sums : [2 Mark]** **02**

2. Now, in Δs ABC and ABD, we have ½



$AC = AD$ (given)

$\angle CAB = \angle DAB$ ($\because$ AB bisects $\angle A$) ½

and $AB = AB$ (common)

$\therefore$ By SAS congruence criterion, we have ½

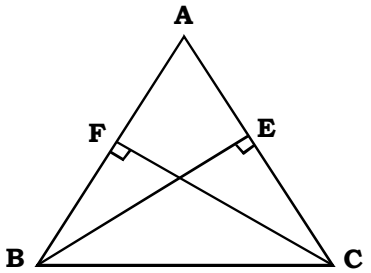
$\Delta ABC \cong \Delta ABD$

$\therefore BC = BD$ (CPCT) ½

Q : 3 **Solve the following sums : [3 Mark]** **03**

3. In Δs BCF and CBE, we have

$\angle BFC = \angle CEB$ ($\because$ Each 90°) ½



Hyp. BC = Hyp. BC (common side)

$FC = EB$ (given) ½

$\therefore$ By R.H.S criterion of congruence, we have

$\Delta BCF \cong \Delta CBE$ ½

$\therefore \angle B = \angle C$ .... (i) (CPCT) ½

Now, in ΔABC

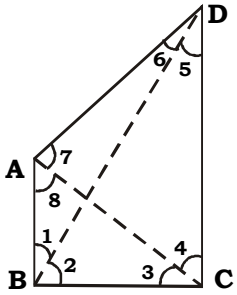
$\therefore \angle B = \angle C$ [from (1)] ½

$AB = AC$ ($\because$ sides opposite to equal angles of a triangle are equal)

$\therefore \Delta ABC$ is an isosceles triangle. ½

Q : 4 **Solve the following sums : [4 Mark]** **04**

4. ABCD is a quadrilateral such that AB is its smallest side and CD is its largest side. ½



Join AC and BD

Since AB is the smallest side of quadrilateral ABCD.

$\therefore$ In Δ ABC, we have $BC > AB$

$\angle 8 > \angle 3$ ... (i) ½

($\because$ Angle opposite to longer side is greater)

Since CD is the longest side of quadrilateral ABCD.

$\because$ In ΔACD, we have $CD > AD$

$\angle 7 > \angle 4$ ... (ii) ½

($\because$ Angle opposite to longer side is greater)

Adding (1) and (2), we get

$\angle 8 + \angle 7 > \angle 3 + \angle 4$

$\angle A > \angle C$ ½

Again, in Δ ABD, we have

$AD > AB$ (AB is the longest side) ½

$\angle 1 > \angle 6$ ... (iii)

In ΔBCD, we have $CD > BC$ (CD is the longest side) ½

$\angle 2 > \angle 5$ ... (iv)

Adding (3) and (4), we get ½

$\angle 1 + \angle 2 > \angle 6 + \angle 5$

$\angle B > \angle D$ ½

Thus, $\angle A > \angle C$ and $\angle B > \angle D$

CHAPTER : 12

Q : 1 Multiplce Choice Questions : [1 Mark] **01**

1. (b) $25\sqrt{3}$

Q : 2 Solve the following sums : [2 Marks] **02**

2. Let a, b and c be the sides of a triangle such that

a = 18cm, b = 10cm and $a + b + c$ = 42cm.

$\therefore$ c = $42 - a - b$

$\therefore$ c = (42 – 18 – 10)cm = 14cm

Now, $s = \frac{1}{2}(a + b + c) = \frac{1}{2} \times 42\text{cm} = 21\text{cm}$. ½

$s - a = 21 - 18 = 3\text{cm}$

$s - b = 21 - 10 = 11\text{cm}$ ½

and $s - c = 21 - 14 = 7\text{cm}$

$\therefore$ Area of the triangle $= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{21 \times 3 \times 11 \times 7}$

$= \sqrt{3 \times 7 \times 3 \times 11 \times 7}$ ½

$= \sqrt{\underline{3 \times 3} \times \underline{7 \times 7} \times 11}$

$= 3 \times 7\sqrt{11}$

$= 21\sqrt{11}$ cm² ½

Q : 3 Solve the following sums : [3 Mark] **03**

3. In one triangular piece, let a = 20cm, b = 50cm and c = 50cm.

Now, $s = \frac{1}{2}(a + b + c) = \frac{1}{2}(20 + 50 + 50)\text{cm}$ ½

$= \frac{1}{2} \times 120\text{cm} = 60\text{cm}$ ½

Now, $s - a = 60 - 20 = 40\text{cm}$

$s - b = 60 - 50 = 10\text{cm}$

$s - c = 60 - 50 = 10\text{cm}$ ½

$\therefore$ Area of the triangle $= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{60 \times 40 \times 10 \times 10}$ ½

$= 200\sqrt{6}$ cm²

$\therefore$ Area of 5 red triangles $= 1000\sqrt{6}$ cm² ½

and, area of 5 green triangles $= 1000\sqrt{6}$ cm² ½

Q : 4 **Solve the following sums : [4 Mark]** **04**

4. Let ABCD be a field in the shape of a trapezium.

Parallel sides, AB = 10m and CD = 25m. ½

Non - parallel sides, AD = 13 m and BC = 14m

Draw BM ⊥ DC, BE || AD.

∴ □ABED is a parallelogram

∴ BE = AD = 13m

and DE = AB = 10m

∴ EC = 25 – 10 = 15m ½

Now, in ΔBEC,

Semi perimeter : $s = \frac{13 + 14 + 15}{2}$

$= \frac{42}{2}$ ½

$= 21m$

Using Heron's Formula,

Area of ΔBEC $= \sqrt{21(21-13)(21-14)(21-15)}$

$= \sqrt{21 \times 8 \times 7 \times 6}$ ½

$= \sqrt{7056}$

$= 84m^2$

Also, area of ΔBEC $= \frac{1}{2} \times b \times h$

∴ $84 = \frac{1}{2} \times EC \times BM$

$84 = \frac{1}{2} \times 15 \times BM$ .... [∵ EC = DC – DE = (25 – 10)m = 15m] ½

∴ $BM = \frac{84 \times 2}{15}$

∴ $BM = 11.2m$

Now, ½

area of trapezium ABCD $= \frac{1}{2} \times (AB + CD) \times BM$

$= \frac{1}{2} \times (10 + 25) \times 11.2$ ½

$= \frac{1}{2} \times 35 \times 11.2$ ½

$= 196m^2$

CHAPTER : 15

Q : 1 **MCQs : [1 Marks Each]** **02**

1. (b) $\frac{3}{7}$

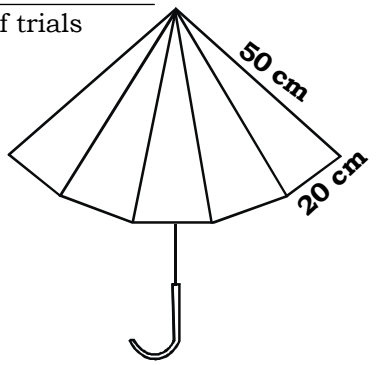
2. (d) $\frac{1}{6}$

Q : 2 **Solve the following sums : [2 Marks Each]** **04**

3. (i) Since three coins are tossed 200 times, so the total number of trials is 200. ½

Probability of getting 2 heads $= \dfrac{\text{No. of outcomes having 2 heads}}{\text{Total number of trials}}$ ½

$= \dfrac{72}{200} = \mathbf{\dfrac{9}{25}}$



3. (ii) Total number of wheat bags = 11 ½

Number of bags having more than 5 kg = 7

$\therefore$ P (a bag contains more than 5 kg) $= \mathbf{\dfrac{7}{11}}$ ½

4. Total number of students in mathematics is 90.

(i) Clearly, from the given table, the number of student who obtained less than 20% marks in the mathematics test = 7. ½

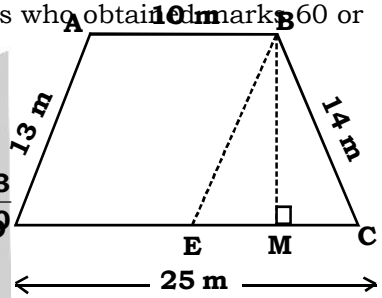
$\therefore$ P (a student obtaining less than 20% marks) $= \mathbf{\dfrac{7}{90}}$ ½

(ii) Clearly, from the given table, number of students who obtained marks 60 or above ½

= (students in 60 – 70) + (students above 70)

= 15 + 8 = 23

$\therefore$ P (a student obtaining marks 60 and above) $= \mathbf{\dfrac{23}{90}}$ ½



Q : 3 **Solve the following sums : [4 Marks]** **04**

5. (i) Number of families earning Rs 10000 – 13000 per month and owning exactly 2 vehicles = 29. ½

$\therefore$ P (Families earning Rs 10000 – 13000 per month and owning exactly 2 vehicles) ½

$= \mathbf{\dfrac{29}{2400}}$

(ii) Number of families earning Rs 16000 or more per month and owning exactly 1 vehicle = 579. ½

$\therefore$ P (Families earning Rs 16000 or more per month and owning exactly 1 vehicle)

$= \mathbf{\dfrac{579}{2400}}$ ½

(iii) Number of families earning less than Rs 7000 per month and does not own any vehicle = 10. ½

$\therefore$ P (Families earning less than Rs 7000 per month and does not own any vehicle) ½

$\dfrac{10}{2400} = \mathbf{\dfrac{1}{240}}$

(iv) Number of families earning Rs 13000 – 16000 per month and owning more than 2 vehicles = 25. ½

$\therefore$ P (Families earning Rs 13000 – 16000 per month and owning more than two vehicles) $= \dfrac{25}{2400} = \mathbf{\dfrac{1}{96}}$ ½

★★★★ ***Best of Luck*** ★★★★