

# Maharashtra Board

## Class IX Mathematics - Algebra

### Sample Paper – 3

**Time: 2 hours**

**Total Marks: 40**

Note: - (1) All questions are compulsory.  
(2) Use of calculator is not allowed.

**1. Attempt any five sub-questions from the following: 5**

- i. Write the following set in the Roster form:  
 $A = \{x | x \text{ is a month of Gregorian year not having 30 days}\}$
- ii. Write the rational number  $1.\bar{3}$  in  $\frac{p}{q}$  form.
- iii. What should be subtracted from  $2a + 6b - 5$  to get  $-3a + 2b + 3$ ?
- iv. Frame a linear equation in two variables representing the following information:  
Length of a rectangle is 4 cm more than its breadth, perimeter of the rectangle is 40 cm.
- v. Find the mean of 7, 6, 10, 13, 1, 3, 4, 4.
- vi. Factorise:  $(a + b)(c + d) - a^2 + b^2$

**2. Attempt any four sub-questions from the following: 8**

- i. Given below are the number of children in each of 34 families in a certain area:  
2, 3, 3, 1, 2, 4, 3, 2, 1, 2, 2, 1, 2, 1, 3, 1, 2,  
1, 2, 1, 2, 2, 2, 3, 1, 2, 2, 1, 1, 2, 2, 3, 1, 2  
Prepare an ungrouped frequency distribution table.
- ii. Find  $E \cup F$ , if  
 $E = \{x | x \in \mathbb{N} \text{ and } x \text{ is a divisor of } 12\}$  and  
 $F = \{y | y \in \mathbb{N} \text{ and } y \text{ is a divisor of } 18\}$ .
- iii. If  $\frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}} = a + b\sqrt{6}$ , find the values of a and b.
- iv. What number is to be added to each of 1, 7, 9 and 31 so that the resulting numbers are in proportion.

v. Observe the figure and answer the following questions.



- What type of bar diagram is it?
- How many boys and girls are there in division D?
- How many girls are there in division B?
- Which division has the equal number of boys and girls?

vi. Use synthetic division method for performing the following division:

$$(x^3 - 4x^2 - 2x + 1) \div (x - 3).$$

**3. Attempt any three of the following sub-questions:**

**9**

i. Find the value of  $x + y$  and  $x - y$  from the example given below without solving for  $x$  and  $y$ .

$$5x + 7y = 17; 7x + 5y = 19$$

ii. Simplify:  $5\sqrt{3} + 2\sqrt{27} + 4\sqrt{\frac{1}{3}}$

iii. The perpendicular distance of a point from the  $x$ -axis is 4 units and the perpendicular distance from the  $y$ -axis is 5 units. Write the coordinates of such a point if it lies in the

- Quadrant I
- Quadrant II
- Quadrant III
- Quadrant IV

iv. If  $\frac{7a^2 + 2b^2}{7a^2 - 2b^2} = \frac{113}{13}$ , find the value of  $\frac{a}{b}$ .

v. Find the median weight of the data:

Weight (kg)	35	36	38	40	42	44	45
Number of students	6	5	8	9	2	7	4

**4. Attempt any two sub-questions from the following: 8**

- If  $U = \{1, 3, 5, 7, 9, 11, 13, 15, 17\}$ ,  $A = \{1, 3, 5, 7\}$ ,  $B = \{1, 3, 9, 11\}$   
Find  $A'$ ,  $B'$ ,  $(A \cap B)'$  and  $(A \cup B)'$ .
- In the following case, divide the first polynomial by the second polynomial and express as Dividend = Divisor  $\times$  Quotient + Remainder.  
 $3x^5 - 4x^4 + 3x^3 + 2x$ ;  $x^2 - 3$ .
- Show  $-\sqrt{2}$  on the number line.

**5. Attempt any two of the following sub-questions: 10**

- $(x - 5)$  is a factor of  $p(x) = x^3 + ax^2 + bx + 30$ . When  $p(x)$  is divided by  $(x + 6)$ , the remainder is  $-396$ . Find the values of  $a$  and  $b$ . Also, factorise  $p(x)$ .
- Plot the following points on a graph paper.
  - $A(-5, 6)$
  - $B(2.2, 7.3)$
  - $C(7, 0)$
  - $D(7, -6)$
  - $E(-8, 0)$
  - $F(0, 4)$
  - $G(-5, -6)$
  - $H(3.5, 4.5)$
  - $I(-3, 5.5)$
- The number of male and female workers on a work in villages A, B, C, D under Employment Guarantee Scheme is given below.

Village	A	B	C	D
Female	150	240	90	140
Male	225	160	210	110

Draw a percentage bar diagram indicating the data.