

# EDUFEST ACADEMY

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## CLASS X | MATHEMATICS

### CHAPTER: LINEAR EQUATIONS IN TWO VARIABLES

Time: 1 Hour

Date: \_\_\_\_\_

Total Marks: 25

#### General Instructions:

1. All questions are compulsory unless stated otherwise.
2. Write answers neatly in the space provided.
3. Marks for each question are indicated in brackets [ ].

#### Q.1 Solve the following subquestions (Any 4)

[8 Marks]

1. Find the values of the following determinants: [1 mark]  
(i)  $\begin{vmatrix} 1.2 & 0.0 \\ 0.57 & -0.23 \end{vmatrix}$       (ii)  $\begin{vmatrix} a & 2 \\ a^2 & 3a \end{vmatrix}$
2. Find values of  $(x+y)$  and  $(x-y)$  for the equations:  $12x + 13y = 38$  and  $13x - 12y = -11$
3. Express in mathematical form using two variables: One number is five more than seven times the other number
4. If  $D_x = -18$  and  $D = 3$  are the values of the determinant for certain simultaneous equations in  $x$  and  $y$ , find  $x$ .
5. What is the point of intersection of the graphs of  $x + y = 4$  and  $2x - y = 2$ ? [1 mark]
6. The sum of two numbers is 97. If the larger number is divided by the smaller, the quotient is 7 and the remainder is 1. Find the numbers. [1 mark]

#### Q.2 A) Choose the correct option

[4 Marks]

1. If the value of the determinant  $\begin{vmatrix} m & 2 \\ -5 & 7 \end{vmatrix}$  is 31, find  $m$ . [1 mark]  
A) 3      B) -3      C) 4      D) -4
2. Which of the following lines are parallel to each other? [1 mark]  
A)  $x + 2y = 4$  and  $x - 2y = 3$       B)  $x + 2y = 4$  and  $x + 2y = 3$   
C)  $x - 2y = 4$  and  $x + 2y = 3$       D)  $x + 2y = 4$  and  $x + 3y = 3$
3. Equations of lines are  $3x + 6y = 12$  and  $x + 2y = 4$ . How many solutions do they have?  
A) Only 1      B) Nil      C) Infinite      D) Only 2
4. The point  $(1, 4/3)$  lies on which of the following lines? [1 mark]  
A)  $5x + 3y = 1$       B)  $5x - 3y = -1$       C)  $3x - 5y = 1$       D)  $5x - 3y = 1$

#### Q.2 B) Solve the following subquestions (Any 2)

[4 Marks]

1. Solve by Cramer's Rule:  $y = (5x - 10)/2$  ;  $4x + 5 = -y$  [2 marks]
2. Seg AB is the diameter of a circle. C is the point on the circumference such that in  $\triangle ABC$ ,  $\angle B$  is less by  $10^\circ$  than  $\angle A$ . Find the measures of all angles of  $\triangle ABC$ . [2 marks]
3. Solve the following simultaneous equations: [2 marks]

$$7/(2x+1) + 13/(y+2) = 27 \quad ; \quad 13/(2x+1) + 7/(y+2) = 33$$

**Q.3 A) Solve the following subquestions (Any 2)**

**[4 Marks]**

1. The perimeter of an isosceles triangle is 24 cm. The length of each congruent side is 13 cm less than twice the length of its base. Find the lengths of all sides. **[2 marks]**
2. Solve:  $(4/x) + (3/y) = 1$  ;  $(8/x) - (9/y) = 7$  **[2 marks]**
3. The entry ticket for an exhibition is Rs. 5/- for children and Rs. 15/- for adults. A group of 13 people visited the exhibition and paid Rs. 115/-. Find the number of children and adults. **[2 marks]**

**Q.3 B) Solve the following subquestions (Any 2)**

**[4 Marks]**

1. Without drawing graphs, show that the following equations are concurrent lines:  $y = 5x - 2$  ;  $y = 5 - 2x$  ;  $2x + 3y = 11$  **[2 marks]**
2. Solve:  $1/(3x) + 1/(5y) = 1/15$  ;  $1/(2x) + 1/(3y) = 1/12$  **[2 marks]**
3. Points (3, -1) and (6, 1) lie on the line represented by  $px + qy = 9$ . Find the values of p and q. **[2 marks]**

**Q.4 Solve the following subquestions (Any 1)**

**[5 Marks]**

1. When the son will be as old as his father today, the sum of their ages then will be 126. When the father was as old as his son is today, the sum of their ages then was 38. Find their present ages. **[5 marks]**
2. A passenger train takes 2 hours more than an express train to travel 240 km from Wardha to Akola. The speed of the passenger train is less than that of the express train by 20 km/hr. Find the average speed of both trains. **[5 marks]**
3. Solve:  $16/(x+y) + 2/(x-y) = 1$  ;  $8/(x+y) - 12/(x-y) = 7$  **[5 marks]**