PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

HOMOGENOUS EQUATION AND WORLD PROBLEMS

EXERCISE

Q.1 Solve the following pair of linear equations

(i) $\frac{1}{2x} - \frac{1}{y} = -1.$ $\frac{1}{x} + \frac{1}{2y} = 8, x \neq 0, y \neq 0$

(ii) $\frac{2}{x} + \frac{2}{3y} = \frac{1}{6},$ $\frac{3}{x} + \frac{2}{y} = 0; x \neq 0\ y \neq 0$

and hence, find a for which $y = ax - 4$.

(iii) $\frac{1}{7x} + \frac{1}{6y} = 3,$ $\frac{1}{2x} - \frac{1}{3y} = 5; x \neq 0\ y \neq 0$

(iv) $\frac{m}{x} - \frac{n}{y} = a,$ $px - qy = 0; x \neq 0\ y \neq 0$

(v) $\frac{2}{y} + \frac{3}{x} = \frac{7}{xy},$ $\frac{1}{y} + \frac{9}{x} = \frac{11}{xy}; x \neq 0, y \neq 0$

(vi) $\frac{xy}{x+y} = \frac{6}{5},$ $\frac{xy}{y-x} = 6; xy \neq 0, y \neq 0$

(vii) $x + y = 5xy$ $3x + 2y = 13\ xy$

Q.2 2 tables and 3 chairs together cost ₹ 2000 whereas 3 tables and 2 chairs together cost ₹ 2500. Find the total cost of 1 table and 5 chairs.

Q.3 Two numbers differ by 4 and their product is 192. Find the numbers.

Q.4 Five years hence, father's age will be three times the age of his son. Five years ago, father was seven times as old as his son Find their present ages.

Q.5 The sum of a two-digit number and the number formed by interchanging its digits is 110. If 10 is subtracted from the first number, the new number is 4 more than 5 times the sum of the digits in the first number. Find the first number.

Q.6 If 2 be added to the numerator of a fraction, it reduces to 1/2 and if 1 be subtracted from the denominator, it reduces to 1/3. Find the fraction.

Q.7 The length of a rectangle exceeds its width by
8 cm and the area of the rectangle is 240 sq. cm. Find the dimensions of the rectangle.

Q.8 Two numbers differ by 4 and their product is 96. Find the numbers.

Q.9 Two numbers are in the ratio of 3 : 5, If 5 is subtracted from each of the number, they become in ratio of 1 : 2. Find the numbers.

Q.10 Two numbers are in the ratio of 3 : 4. If 8 is added to each number, they become in the ratio of 4 : 5. Find the numbers.

ANSWER KEY

1. (i) $x = \frac{1}{6}$, $y = \frac{1}{4}$

(ii) $x = 6$, $y = -4$, $a = 0$

(iii) $x = \frac{1}{14}$, $y = \frac{1}{6}$

(iv) $x = \frac{mp-nq}{ap}$, $y = \frac{mp-nq}{aq}$

(v) $x = 2$, $y = 1$

(vi) $x = 2$, $y = 3$

(vii) $x = \frac{1}{2}$, $y = \frac{1}{3}$

2. ₹ 1700

3. 12 and 16

4. Son's age = 10 years, father's age = 40 years

5. 64

6. $\frac{3}{10}$

7. Length = 20 cm, Width = 12cm

8. 8 and 12

9. 15 and 25

10. 24 and 32