

Mathematics

Chapter 2 – Polynomials

Exercise 2.2

2. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes, respectively.

(vi) 4, 1 (.....Contd)

Solution: Given, Sum of zeroes = $\alpha + \beta = 4$

Product of zeroes = $\alpha\beta = 1$

\therefore If α and β are zeroes of any quadratic polynomial, then the quadratic polynomial equation can be written directly as:-

$$x^2 - (\alpha + \beta)x + \alpha\beta = 0$$

$$x^2 - 4x + 1 = 0$$

Thus, $x^2 - 4x + 1$ is the quadratic polynomial.

Chapter 3 – Pair of Linear Equations in Two Variables

Exercise 3.1

1. Form the pair of linear equations in the following problems, and find their solutions graphically.

(i) 10 students of Class X took part in a Mathematics quiz. If the number of girls is 4 more than the number of boys, find the number of boys and girls who took part in the quiz.

(ii) 5 pencils and 7 pens together cost ₹ 50, whereas 7 pencils and 5 pens together cost ₹ 46. Find the cost of one pencil and that of one pen.

Soln: (i) Let there are x number of girls and y number of boys. As per the given question, the algebraic expression can be represented as follows.

$$x + y = 10$$

$$x - y = 4$$

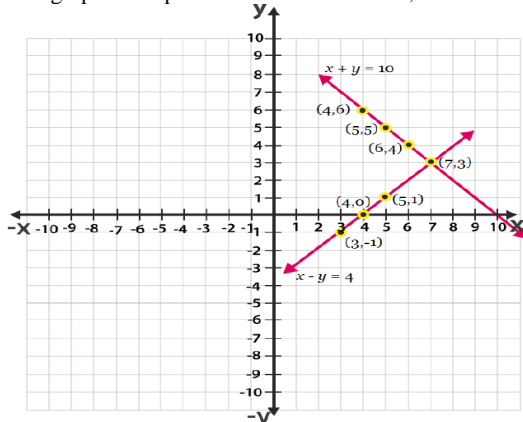
Now, for $x + y = 10$ or $x = 10 - y$, the solutions are;

x	5	4	6
y	5	6	4

For $x - y = 4$ or $x = 4 + y$, the solutions are;

x	4	5	3
y	0	1	-1

The graphical representation is as follows;



From the graph, it can be seen that the given lines cross each other at point (7, 3). Therefore, there are 7 girls and 3 boys in the class.

(ii) Let 1 pencil costs Rs. x and 1 pen costs Rs. y .

According to the question, the algebraic expression can be represented as;

$$5x + 7y = 50$$

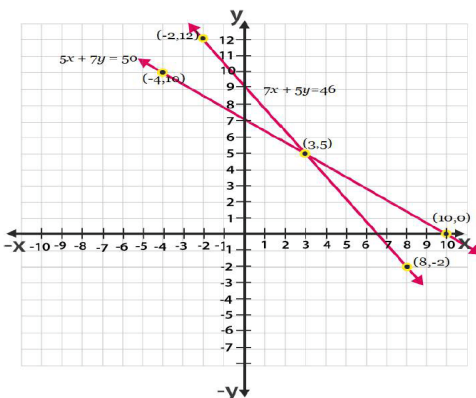
$$7x + 5y = 46$$

For, $5x + 7y = 50$ or $x = (50 - 7y)/5$, the solutions are;

x	3	10	-4
y	5	0	10

For $7x + 5y = 46$ or $x = (46 - 5y)/7$, the solutions are;

x	8	3	-2
y	-2	5	12



From the graph, it is can be seen that the given lines cross each other at point (3, 5).

So, the cost of a pencil is 3/- and cost of a pen is 5/-.

2. On comparing the ratios $\frac{a_1}{a_2}$, $\frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, find out whether the lines representing the

following pairs of linear equations intersect at a point, are parallel or coincident:

(i) $5x - 4y + 8 = 0$

$7x + 6y - 9 = 0$

(ii) $9x + 3y + 12 = 0$

$18x + 6y + 24 = 0$

(iii) $6x - 3y + 10 = 0$

$2x - y + 9 = 0$

Soln: (i) Given expressions;

$$5x - 4y + 8 = 0$$

$$7x + 6y - 9 = 0$$

Comparing these equations with $a_1x + b_1y + c_1 = 0$

And $a_2x + b_2y + c_2 = 0$

We get,

$$a_1 = 5, \quad b_1 = -4, \quad c_1 = 8$$

$$a_2 = 7, \quad b_2 = 6, \quad c_2 = -9$$

$$(a_1 / a_2) = 5 / 7$$

$$(b_1 / b_2) = -4 / 6 = -2 / 3$$

$$(c_1 / c_2) = 8 / -9$$

Since, $(a_1 / a_2) \neq (b_1 / b_2)$

So, the pairs of equations given in the question have a unique solution and the lines cross each other at exactly one point.

(ii) Given expressions;

(Contd....)