X Test - 6

1) A quadratic polynomial whose sum and product of zeroes are -3 and 2 is
(a) x^2-3x+2 (b) x^2+3x+2 (c) x^2+2x-3 (d) x^2+2x+3.

2) The system of linear equations $2x=3(y-3)$; $6x-9y=5$ represents a pair of (a) parallel lines (b) coincident lines (c) intersecting lines (d) none of these.

3) The coefficient of x in the polynomial $2x(5-3x)-x$ is
(a) 2 (b) -3 (c) 9 (d) 10

4) The equations $x-y=0.9$ and $\frac{11}{x+y}=2$ have the solution
(a) $x=5$ and $y=1$ (b) $x=3.2, y=2.3$ (c) $x=3, y=2$ (d) $x=2, y=3$

5) If one of the zeroes of the quadratic polynomial x^2+3x+k is 2, then the value of k is (a) 10 (b) -10 (c) 5 (d) -5

6) If $(5,4)$ is a solution of the equation $3y=ax+7$, then the value of a is (a) 2 (b) $\frac{1}{2}$ (c) 1 (d) -1

7) If sum of the zeroes of $f(x)=px^2+5x+8p$ is equal to the product of the zeroes, then find the value of p.

8) For which value(s) of k does the pair of equations given below has a unique solution?
$kx+2y=3$; $3x+6y=10$

9) If the polynomial $6x^4+8x^3+17x^2+21x+7$ is divided by another polynomial $3x^2+4x+1$, the remainder comes out to be $ax+b$, then find the values of a and b.

10) Solve: $\frac{5}{x+y}-\frac{2}{x-y}=-1$; $\frac{15}{x+y}+\frac{7}{x-y}=10$

11) The sum of the digits of a two digit number is 12. The number obtained by interchanging the digits exceeds the given number by 18. Find the number.

X Test-6 (Answers)

1) Let the zeroes be α and β.

Then, $\alpha+\beta = -3$

$\alpha\beta = 2$

$\therefore$ the required quadratic polynomial

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

$= x^2 - (-3)x + 2$

$= x^2 + 3x + 2$ (b)

2) $2x = 3(y-3) \Rightarrow 2x = 3y - 9 \Rightarrow 2x - 3y - 9 = 0 \longrightarrow (1)$

$6x - 9y = 5 \Rightarrow 6x - 9y - 5 = 0 \longrightarrow (2)$

Let the given equations be in the form $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$;

where $a_1 = 2, b_1 = -3, c_1 = -9$

and $a_2 = 6, b_2 = -9, c_2 = -5$

$\frac{a_1}{a_2} = \frac{2}{6} = \frac{1}{3}$

$\frac{b_1}{b_2} = \frac{-3}{-9} = \frac{1}{3}$

$\frac{c_1}{c_2} = \frac{-9}{-5} = \frac{9}{5}$

$\therefore \frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

Hence the given lines are parallel lines (a)

3) $2x(5-3x) - x = 10x - 6x^2 - x$

$= 9x - 6x^2$

$\therefore$ coefficient of x is 9 (c)

4) $x - y = 0.9 \longrightarrow (1)$

$\frac{11}{x+y} = 2 \Rightarrow 11 = 2x + 2y$

$\Rightarrow x + y = \frac{11}{2} \longrightarrow (2)$

(1) + (2), $2x = 0.9 + \frac{11}{2} = 0.9 + 5.5$

$\Rightarrow 2x = 6.4$

$\Rightarrow x = 3.2$ //

From eq:(2), $y = 5.5 - 3.2 = 2.3$ // (b)

5) Let $p(x) = x^2+3x+k$

Since 2 is one of the zeroes, $p(2)=0$

$$\Rightarrow 2^2+3\times2+k=0$$
$$\Rightarrow 4+6+k=0$$
$$k=-10 \quad \text{(b)}$$

6) Since (5,4) is a solution of $3y = ax+7$

$$\Rightarrow 3\times4 = 5a+7$$
$$\Rightarrow 5a = 12-7$$
$$\Rightarrow 5a=5$$
$$a=1 \quad \text{(c)}$$

7) Let α and β be the zeroes of $f(x) = px^2+5x+8p$ and of the form ax^2+bx+c; where $a=p$, $b=5$, $c=8p$.

ATQ, $\alpha+\beta = \alpha\beta$

$$\Rightarrow -\frac{b}{a} = \frac{c}{a}$$
$$\Rightarrow -\frac{5}{p} = \frac{8\cancel{p}^{1}}{\cancel{p}_{1}}$$
$$\Rightarrow p = -\frac{5}{8}$$

8) Let $kx+2y=3 \Rightarrow kx+2y-3=0$ and $3x+6y=10 \Rightarrow 3x+6y-10=0$ be of the form $a_1x+b_1y+c_1=0$ and $a_2x+b_2y+c_2=0$;

where $a_1=k$, $b_1=2$, $c_1=-3$

and $a_2=3$, $b_2=6$, $c_2=-10$

For unique solution, $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

$$\Rightarrow \frac{k}{3} \neq \frac{\cancel{2}^{1}}{\cancel{6}_{3}}$$
$$\Rightarrow k \neq \frac{3}{3}$$
$$\Rightarrow k \neq 1$$

Hence k can take any real value other than 1.

9) On dividing,

$$2x^2+5$$
$$3x^2+4x+1 \,\big)\, \cancel{6x^4}+\cancel{8x^3}+17x^2+21x+7$$
$$\overset{(-)}{}\cancel{6x^4}\overset{(-)}{+}\cancel{8x^3}\overset{(-)}{+}2x^2$$
$$\cancel{15x^2}+21x+7$$
$$\overset{(-)}{}\cancel{15x^2}\overset{(-)}{+}20x\overset{(-)}{+}5$$
$$x+2$$

On comparing the remainder with $ax+b$,

$a=1$

$b=2$

10) Let $\frac{1}{x+y}=a$; $\frac{1}{x-y}=b$

Then, $5a-2b=-1 \rightarrow (1)$

Also, $15a+7b=10 \rightarrow (2)$

$(1)\times 3$, $15a-6b=-3 \rightarrow (3)$

(2) , $15a+7b=10 \rightarrow (2)$

$(3)-(2)$, $-13b=-13$

$b=1$

From eq: (1), $5a-2=-1$

$\Rightarrow 5a=1$

$a=\frac{1}{5}$

$\therefore\ x+y=5$

$x-y=1$

$(+)$, $2x=6$

$x=3$

$y=2$

11) Let the digit in the ten's place be x and that in unit's place be y.

T	O
x	y

Then, original number $=10x+y$

Reversed number $=10y+x$

T	O
y	x

ATQ, $x+y=12 \rightarrow (1)$

Also, $(10y+x)-(10x+y)=18 \rightarrow (2)$

$$\Rightarrow 10y + x - 10x - y = 18$$
$$\Rightarrow 9y - 9x = 18$$
$$\Rightarrow y - x = 2 \longrightarrow (2)$$

$(1)+(2)$, $2y = 14$

$y = 7$

$x = 5$

Hence the required number is $\underline{\underline{57}}$