Extra Practice Work - 1 (8th May)

1) Solve for x: $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$; $x \neq -4, 7$

2, 1

2) The zeroes of the polynomial $x^2 - 3x - m(m+3)$ are

(a) $m, m+3$ (b) $-m, m+3$ (c) $m, -(m+3)$
(d) $-m, -(m+3)$

3) The common difference of the AP $\frac{1}{p}, \frac{1-p}{p}, \frac{1-2p}{p}, \ldots$ is

(a) 1 (b) $\frac{1}{p}$ (c) -1 (d) $-\frac{1}{p}$

4) Solve for x: $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$; where $a+b \neq 0$

$-a, -b$

5) Solve for x and y:

$$\frac{x}{2} + \frac{2y}{3} = -1 \; ; \; x - \frac{y}{3} = 3$$

2, -3

5) $\frac{x}{2} + \frac{2y}{3} = -1$

$\frac{x \times 3}{2 \times 3} + \frac{2y \times 2}{3 \times 2} = -1$

LCM

$\Rightarrow \frac{3x + 4y}{6} = -1$

$\Rightarrow 3x + 4y = -6 \longrightarrow (1)$

$\frac{x \times 3}{1 \times 3} - \frac{y}{3} = 3$

LCM

$\Rightarrow \frac{3x - y}{3} = 3$

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

$(1) - (2) \Rightarrow 5y = -15$

$\boxed{y = -3}$

From eq: (2), $3x + 3 = 9$

$3x = 6$

$\boxed{x = 2}$

3) $a_1 = \frac{1}{p}$ first term

$a_2 = \frac{1-p}{p}$ second term

$d = a_2 - a_1 = \frac{1-p}{p} - \frac{1}{p}$

$= \frac{1}{p} - \frac{p}{p} - \frac{1}{p}$

$= -\frac{p}{p} = -1$ (c)

4) $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$

$\Rightarrow \frac{1}{a+b+x} - \frac{1}{x} = \frac{1}{a} + \frac{1}{b}$

$\Rightarrow \frac{x-a-b-x}{x(a+b+x)} = \frac{b+a}{ab}$ LCM

$\Rightarrow \frac{-(a+b)}{x(a+b+x)} = \frac{a+b}{ab}$ cancel

$\Rightarrow -ab = x(a+b+x)$ cross X

$\Rightarrow x^2 + ax + bx + ab = 0$

$\Rightarrow x^2 + (a+b)x + ab = 0$

$\Rightarrow (x+a)(x+b) = 0$

$\therefore x = -a, -b$

Answers

1) $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$

take lcm

$\Rightarrow \frac{(x-7)-(x+4)}{(x+4)(x-7)} = \frac{11}{30}$

$\Rightarrow \frac{x-7-x-4}{(x+4)(x-7)} = \frac{11}{30}$

cross multiply

$\Rightarrow 30x - 11 = 11(x+4)(x-7)$

$\Rightarrow -30 = x^2 - 3x - 28$

$\Rightarrow x^2 - 3x + 2 = 0$

split the middle term

$\Rightarrow x^2 - x - 2x + 2 = 0$

group and factorise

$\Rightarrow x(x-1) - 2(x-1) = 0$

$\Rightarrow (x-2)(x-1) = 0$

$\therefore x = 1$ or 2

2) Let $p(x) = x^2 - 3x - m(m+3) = 0$

$\Rightarrow x^2 - 3x - m^2 - 3m = 0$

$\Rightarrow (x^2 - m^2) - (3x + 3m) = 0$

$\Rightarrow (x+m)(x-m) - 3(x+m) = 0$

$\Rightarrow (x+m)[x-m-3] = 0$

$\therefore x = -m$ or $m+3$ **(b)**