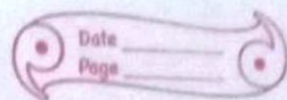


40. QUADRATIC EQUATION :



EXERCISE : 401.

$$10) (x + 1)^2 = 2(x - 3)$$

$$\Rightarrow x^2 + 1^2 + 2 \times x \times 1 = 2(x - 3)$$

$$\Rightarrow x^2 + 1 + 2x = 2x - 6$$

$$\Rightarrow x^2 + 1 + 2x = 2x + 6 = 0$$

$$\Rightarrow x^2 + 1 + 6 = 0$$

$$\Rightarrow x^2 + 7 = 0$$

$$\Rightarrow x^2 + 0x + 7 = 0$$

Since it is of the form $ax^2 + bx + c = 0$
where $a = 1$, $b = 0$, $c = 7$

Hence it is quadratic equation.

$$(11) x^2 - 2x - (-2)(3 - 5)$$

$$\Rightarrow x^2 - 2x - (-2)3 - (-2)x$$

$$\Rightarrow x^2 - 2x = -6 + 2x$$

$$\Rightarrow x^2 - 2x - 2x + 6 = 0$$

It is in form $ax^2 + bx + c = 0$
where $a = 1$, $b = -4$, $c = 6$

Hence it is quadratic equation.

$$(iii) (x-2)(x+1) = (x-1)(x+3)$$

$$\Rightarrow (x-2)(x+1) = (x-1)(x+3)$$

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

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

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

$$\Rightarrow 0 - 3x + 1 = 0$$

$$\Rightarrow -3x + 1 = 0$$

Since highest power is 1 and 2

$$(iv) (x-3)(2x+1) = x(x+5)$$

$$\Rightarrow (x-3)(2x+1) = x(x+5)$$

$$\Rightarrow x(2x+1) - 3(2x+1) = x(x+5)$$

$$\Rightarrow 2x^2 + x - 6x - 3 = x^2 + 5x$$

$$\Rightarrow 2x^2 + x - 6x - 5x - 3 = 0$$

$$\Rightarrow x^2 - 10x - 3 = 0$$

Since equation in form of $ax^2 + bx + c$

So it is a

quadratic eq.

$$(v) (2x-1)(x-3) = (x+5)(x-1)$$

$$\Rightarrow 2x(x-3) - 1(x-3) = x(x-1) + 5(x-1)$$

$$\Rightarrow 2x^2 + 6x - x + 3 = x^2 - x + 5x - 5$$

$$\Rightarrow 2x^2 - x^2 - 6x - x + x - 5x + 3 + 5 = 0$$

$$\Rightarrow x^2 - 11x + 8 = 0$$

So it is a quadratic eq.

Q 20) Area = 528 m^2

and,

Length = $2x + 1$

So

~~Area~~
 $528 = (2x + 1)x$

$= (2x + 1)x = 528$

$= 2x^2 + x = 528$

$= 2x^2 + x - 528 = 0$

It is in the form of $ax^2 + bx + c$

where $a = 2$, $b = 1$, $c = -528$

Hence it is a quadratic equation.

(ii) Let the first integer = x

Second integer = $x + 1$

So,

~~Area~~

$x(x + 1) = 306$

$\Rightarrow x^2 + 1 = 306$

$\Rightarrow x^2 + x = 306$

$\Rightarrow x^2 + x - 306 = 0$

So it is a quadratic eq.

(ii) Let Rohan's age = x
 Rohan's mother age = $x + 26$

After 3 yrs.

Rohan's age = $x + 3$

So product of ages after 3 yrs = 360

$$(x + 3)(x + 29) = 360$$

$$= x(x + 29) + 3(x + 29) = 360$$

$$= x^2 + 29x + 3x + 87 = 360$$

$$= x^2 + 29x + 3x + 87 - 360 = 0$$

$$= x^2 + 32x - 273 = 0$$

So it is a quadratic eq.

(v) Dis = 480 km

Speed = x km/hr

$$\text{Speed} = \frac{d}{t}$$

$$= \frac{480}{x}$$

Dis = 480 km

Speed = $(x - 8)$ km/hr

$$\text{Time} = \frac{480}{x} + 3$$

$$\text{Speed} = \frac{d}{t} =$$

$$x - 8 = \frac{480}{\left(\frac{480}{x} + 3\right)}$$

$$(x - 8) \left(\frac{480}{x} + 3\right) = 480$$

$$\Rightarrow (x - 8) \left(\frac{480}{x} + 3\right) = 480$$

$$\Rightarrow (x - 8)(480 + 3x) = 480$$

$$\Rightarrow 3x^2 - 24x - 3840 = 0$$

$$\Rightarrow x^2 - 8x - 1280 = 0$$