Ex 4.1 **Ch-4 Quadratic Equations**

1)

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

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

$\Rightarrow x^2 + 7 = 0$

It is of the form $ax^2 + bx + c = 0$

Hence, the given equation is a quadratic equation.

(ii) $x^2 - 2x \cdot = (-2)(3-x)$

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

$\Rightarrow x^2 - 4x + 6 = 0$

It is the form $ax^2 + bx + c = 0$

Hence, this equation is a Quadratic equation.

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

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

$\Rightarrow 3x - 1 = 0$

It is not of the form $ax^2 + bx + c = 0$

Hence, this equation is not a quadratic equation.

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

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

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

It is of the form $ax^2 + bx + c = 0$

Hence, the given equation is a quadratic equation.

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

Ans $\Rightarrow 2x^2 - 7x + 3 = x^2 + 4x - 5$

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

It is of the form $ax^2 + bx + c = 0$

Hence, the given equation is a quadratic equation.

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

Ans $\Rightarrow x^2 + 3x + 1 = x^2 + 4 - 4x$

$\Rightarrow 7x - 3 = 0$

It is not in the form of $ax^2 + bx + c = 0$

Hence, the given equation is not a quadratic equation.

(vii) $(x+2)^2 = 2x(x^2-1)$

Ans $\Rightarrow x^2+8+6x^2+12x = 2x^3-2x$

$\Rightarrow x^3-14x-6x^2-8=0$

It is not of the form $ax^2+bx+c=0$

Hence, the given equation is not a Quadratic equation.

(viii) $x^3-4x^3-x+1 = (x-2)^3$

Ans $\Rightarrow x^3-4x^2-x+1 = x^3-8-6x^3+12x$

$\Rightarrow 2x^2-13x+9=0$

It is not in the form $ax^2+bx+c=0$

Hence, the given equation is not a Quadratic equation

Q2)

Ans Let the breadth of the plot be x

So, the length of the plot is $(2x+1)$m.

Area of the rectangle $= l \times b$

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

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

$2x^2-32x+33x-528=0$

$2x(x-16) + 33(x-16) = 0$

$(2x+33)(x-16) = 0$

So, $b = 16$

$l = 33$

∴ Length of the plot is 33m and breadth is 16m

c(i)

ans Let the consecutive integers be x and $x+1$

It is given that their product is 306

So, $x(x+1) = 306$

$x^2 + x = 306$

$x^2 + x - 306 = 0$

$x^2 + 18x - 17x - 306 = 0$

$x(x+18) - 17(x+18) = 0$

$(x-17)(x+18) = 0$

∴ Two consecutive integer are 17 and 18

$\boxed{x = 17}$

$\boxed{x+1}$ | $x = -18$

$x =$

(iii) ans Let Rohan's age be x

Hence his mother's age $= x+26$

3 years hence,

Rohan's age $= x+3$

Mother's age $= x+26+3 = x+29$

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

$x^2 + 29x + 3x + 87 = 360$ $\quad x^2+32x-273=0$

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

$x^2 + 3x$

∴ This is the required equation

② $29 \times 3 = 87$

$87 - 29 = 58$

(iv) ans Let the speed of the train be x km/hr. Then

Time taken to travel a distance of 480 km $= \frac{480}{x}$ hr

① $360 + 58 = 418$

So,

$(x-8)$ km/hr $= \frac{480}{x-8}$ hr

$$\frac{480}{x-8} = \frac{480}{x} + 3$$

$\Rightarrow \frac{480}{x-8} - \frac{480}{x} = 3$

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

$\Rightarrow \frac{480 \times 8}{x(x-8)} = 3$

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

$\Rightarrow x(x-8) = 160 \times 8$

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

$\therefore$ This is the required equation.