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QUADRATIC EQUATIONS

Quadratic Equations(part-2)

Chapter: 4, Exercise: 4.1

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Represent the following situations in the form of quadratic equations :

$$[ax^2 + bx + c = 0]$$

1) The area of a rectangular plot is 528 m². The length of the plot (in meters) is one more than twice its breadth. We need to find the length and breadth of the plot.

given Area of Rectangular Plot = 528 m²
 Let breadth = x m ✓
 length = $(2x + 1)$ m ✓
 Area of Rectangle
 $L \times B = 528$
 $(2x + 1)(x) = 528$
 $2x^2 + x = 528$
 $2x^2 + x - 528 = 0$ ✓

$2x^2 + x - 528 = 0$
 $2x^2 + 33x - 32x - 528 = 0$
 $x(2x + 33) - 16(2x + 33) = 0$
 $(x - 16)(2x + 33) = 0$
 $x = 16$, $2x = -33$
 $x = \frac{-33}{2}$
 $l = 2(k) + 1$
 $= 133m$

AC = -1056
 $b = b_1 + (-b_2)$
 $= 33 - 32$
 $= 1$
 $33x - 32$



2) The product of two consecutive positive integers is 306. We need to find the integers.

1, 2, 3 - - -

Let two consecutive positive integers = $x, (x+1)$

$$x \times (x+1) = 306$$

$$x^2 + x = 306$$

$$\boxed{x^2 + x - 306 = 0} \quad \checkmark$$



3) Rohan's mother is 26 years older than him. The product of their ages 3 years from now will be 360. We would like to find Rohan's present age.

Let the Present age of Rohan = x year

Rohan's mother = $x + 26$ year

3 years from now

Rohan's age = $(x + 3)$ year

Rohan's mother age = $x + 26 + 3$
= $(x + 29)$ year

acc. to question

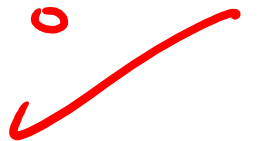
$$(x + 3)(x + 29) = 360$$

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

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

$$x^2 + 32x + 87 - 360 = 0$$

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



4) A train travels a distance of 480 km at a uniform speed. If the speed had been 8 km/h less, then it would have taken 3 hours more to cover the same distance. We need to find the speed of the train

480 km → distance

$$\text{time} = \frac{\text{distance}}{\text{speed}}$$

$$t = \frac{480}{x} \quad \text{--- (1)}$$

acc. to question

$$\text{speed} = (x - 8) \text{ km/h}$$

$$\text{time} = \left(\frac{480}{x} + 3 \right)$$

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

let the speed train = x km/h

$$\begin{array}{r} 480 \times 6 \\ \times 2 \\ \hline 3840 \end{array}$$

$$d = s \times t$$

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

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

$$\cancel{480} = \cancel{480} + 3x - \frac{3840}{x} - 24$$

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

$$\boxed{3x^2 - 24x - 3840 = 0}$$

