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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 m^2. 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 m^2

let breadth = x m

length = $(2x+1)$ m

Area of Rectangle

$L \times B = 528$

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

$2x^2+x = 528$

$2x^2+x-528=0$ ✓

$2x^2+1x-528=0$

$a \times c = -528 \times 2$

$a \times c = -1056$

$b = b_1 + b_2$

$= 33 - 32$

$= 1$

$33x - 32x$

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

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

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

$x=16$, $2x=-33$

$x=-\frac{33}{2}$

$l = 2(k)+1$

$= 33m$

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, $(x+1)$

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

$$x^2 + x = 306$$

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

✓

^

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 ques-

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

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

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

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

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

35
360
87
273

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

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

let the speed train = x km/h

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

$t = \frac{480}{x}$ — (1)

acc to question

speed = (x − 8) km/h

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

$d = s \times t$

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

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

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

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

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

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

480 × x = 3840