## Ncert Solutions Chapter 4 Quadratic Equations Exercise 4.2

Question 2. Represent the following situations in the form of Quadratic Equations:

(i) The area of rectangular plot is  $528 \text{ m}^2$ . The length of the plot (in metres) is one more than twice its breadth. We need to find the length and breadth of the plot.

#### Solution :

We are given that area of a rectangular plot is  $528 m^2$ .

Let breadth of rectangular plot be x metres

Length is one more than twice its breadth. Therefore, length of rectangular plot is (2x+1) metres

Area of rectangle = length × breadth  $\Rightarrow 528 = x(2x+1)$   $\Rightarrow 528 = 2x^2 + x$  $\Rightarrow 2x^2 + x - 528 = 0$  which is a Quadratic Equation.

(ii) The product of two consecutive numbers is 306. We need to find the integers.

#### Solution :

Let two consecutive numbers be x and (x+1). It is given that x(x+1) = 306  $\Rightarrow x^2 + x = 306$  $\Rightarrow x^2 + x - 306 = 0$  which is a Quadratic Equation.

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

#### Solution :

Let present age of Rohan = x years Let present age of Rohan's mother = x + 26 years Age of Rohan after 3 years = (x+3) years Age of Rohan's mother after 3 years = x+26+3 = x+29 years

According to given condition : (x+3)(x+29) = 360  $\Rightarrow x^2 + 29x + 3x + 87 = 360$  $\Rightarrow x^2 + 32x - 273 = 0$ , which is a Quadratic Equation.

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

**Solution**: Let speed of train be x km / h

Time taken by train to cover 480  $km = \frac{480}{x}$  hours If, speed had been 8km/hr less then time taken would be  $\frac{480}{x-8}$  hours

According to given condition, if speed had been 8km/hr less then time taken would be 3 hours less.

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

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$$\Rightarrow 480(\frac{1}{x-8} - \frac{1}{x}) = 3$$
$$\Rightarrow 480(\frac{x-x+8}{x(x-8)}) = 3$$
$$\Rightarrow 480 \times 8 = 3(x)(x-8)$$
$$\Rightarrow 3840 = 3x^2 - 24x$$
$$\Rightarrow 3x^2 - 24x - 3840 = 0$$

Dividing equation by 3, we get  $x^2 - 8x - 1280 = 0$  which is a Quadratic Equation.

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