

## Ncert Solutions Chapter 4 Quadratic Equations Exercise 4.3 Question 7

**Question 7** The difference of squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find the two numbers.

**Solution :**

Let smaller number =  $x$

Let larger number =  $y$

We are given that  $y^2 - x^2 = 180$  (1)

Also, we are given that square of smaller number is 8 times the larger number.

$\Rightarrow x^2 = 8y$  (2)

Putting equation (2) in (1), we get

$$y^2 - 8y = 180$$

$$\Rightarrow y^2 - 8y - 180 = 0$$

Comparing equation  $y^2 - 8y - 180 = 0$  with general form  $ay^2 + by + c = 0$ , we get  
 $a = 1$ ,  $b = -8$  and  $c = -180$ .

Using quadratic formula,  $y = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ , we get

$$y = \frac{8 \pm \sqrt{(-8)^2 - 4(1)(-180)}}{2}$$

$$\Rightarrow y = \frac{8 \pm \sqrt{64 + 720}}{2} = \frac{8 \pm 28}{2} = \frac{8 \pm 28}{2} \quad \Rightarrow y = 18, -10$$

$$\Rightarrow y = \frac{8+28}{2}, \frac{8-28}{2}$$

$$\Rightarrow y = 18, -10$$

Using equation (2) to find smaller number :

$$x^2 = 8y$$

$$\Rightarrow x^2 = 8y = 8 \times 18 = 144$$

$$\Rightarrow x = \pm 12$$

*And,*

$$x^2 = 8y = 8 \times -10 = -80 \text{ \{No real solution for x\}}$$

Therefore two numbers are  $(12,18)$  or  $(-12,18)$

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