



Exercise 10D

Question 7:

Let the required number be $3x$ and $3(x+1)$.

Then, $3x \times 3(x+1) = 270 \Rightarrow 3x \times (3x+3) = 270$

$$\Rightarrow 9x^2 + 9x - 270 = 0$$

$$\Rightarrow x^2 + x - 30 = 0$$

$$\Rightarrow x^2 + 6x - 5x - 30 = 0$$

$$\Rightarrow x(x+6) - 5(x+6) = 0$$

$$(x+6)(x-5) = 0$$

$$(x+6) = 0 \text{ or } (x-5) = 0$$

$$x = -6 \text{ or } x = 5$$

But -6 is not a positive integer

Hence, required numbers are 15 and 18 since numbers are multiples of 3.

Question 8:

Let the required consecutive positive even integer be $2x$ and $(2x+2)$, then

$$(2x)^2 + (2x+2)^2 = 340 \Rightarrow 8x^2 + 8x - 336 = 0$$

$$\Rightarrow x^2 + x - 42 = 0$$

$$\Rightarrow x^2 + 7x - 6x - 42 = 0$$

$$\Rightarrow x(x+7) - 6(x+7) = 0$$

$$\Rightarrow (x+7)(x-6) = 0$$

$$x+7 = 0 \text{ or } x-6 = 0$$

$$x = -7 \text{ or } x = 6$$

But -7 is not an even positive integer

Hence, the required integers are 12 and 14.

Question 9:

Let the required number be x

$$\text{Then, } x + x^2 = \frac{63}{4} \Rightarrow 4x + 4x^2 = 63$$

$$\Rightarrow 4x^2 + 4x - 63 = 0$$

$$\Rightarrow 4x^2 + (18x - 14x) - 63 = 0$$

$$\Rightarrow 4x^2 + 18x - 14x - 63 = 0$$

$$\Rightarrow 2x(2x + 9) - 7(2x + 9) = 0$$

$$\Rightarrow (2x + 9)(2x - 7) = 0$$

$$\Rightarrow 2x + 9 = 0, \text{ or } 2x - 7 = 0$$

$$x = \frac{-9}{2}, x = \frac{7}{2}$$

Hence, the required number is $\frac{-9}{2}$ or $\frac{7}{2}$

Question 10:

Let the required number be x, then

$$x + \sqrt{x} = \frac{6}{25} \Rightarrow y + y^2 = \frac{6}{25} \text{ where } \sqrt{x} = y$$

$$\Rightarrow 25y^2 + 25y - 6 = 0$$

$$\Rightarrow 25y^2 + (30y - 5y) - 6 = 0$$

$$\Rightarrow 25y^2 + 30y - 5y - 6 = 0$$

$$\Rightarrow 5y(5y + 6) - 1(5y + 6) = 0$$

$$\Rightarrow (5y + 6)(5y - 1) = 0$$

$$\Rightarrow (5y + 6) = 0 \text{ or } (5y - 1) = 0$$

$$y = \frac{-6}{5} \text{ or } y = \frac{1}{5}$$

$\frac{-6}{5}$ is not positive number

$$y = \frac{1}{5} \Rightarrow \sqrt{x} = \frac{1}{5}$$

$$\Rightarrow \sqrt{x} = \frac{1}{5}$$

$$(\sqrt{x})^2 = \left(\frac{1}{5}\right)^2$$

$$x = \frac{1}{25}$$

hence, the required number is $\frac{1}{25}$

Question 11:

Let the required number be x and $x - 3$, then

$$x(x - 3) = 504 \Rightarrow x^2 - 3x - 504 = 0$$

$$\Rightarrow x = \frac{3 \pm \sqrt{9 + 2016}}{2} = \frac{3 \pm \sqrt{2025}}{2} = \frac{(3 \pm 45)}{2}$$

$$\Rightarrow x = \frac{3 + 45}{2} = 24 \text{ or } x = \frac{(3 - 45)}{2} = \frac{-42}{2} = -21$$

Hence, the required numbers are (24,21) or (-21 and -24).

***** END *****