



### Exercise 11B

Question 5:

Let the required number be  $(a - d)$ ,  $a$  and  $(a + d)$

Sum of these numbers =  $(a - d) + a + (a + d) = 3a$

Product of these numbers =  $(a - d) \times a \times (a + d) = a(a^2 - d^2)$

But sum = 24 and product = 440

$$\therefore 3a = 24 \Rightarrow a = 8$$

$$\text{and } a(a^2 - d^2) = 8(64 - d^2) = 440$$

$$\Rightarrow 64 - d^2 = 55$$

$$\Rightarrow d^2 = 9$$

$$\Rightarrow d = 3$$

Thus,  $a = 8$  and  $d = 3$

Hence the required numbers are (5, 8, 11)

Question 6:

Let the required numbers be  $(a - d)$ ,  $a$ ,  $(a + d)$

Sum of these numbers =  $(a - d) + a + (a + d) = 3a$

$$\therefore \text{sum of these squares} = (a - d)^2 + a^2 + (a + d)^2 = 3a^2 + 2d^2$$

Sum of three numbers = 21, sum of squares of these numbers = 165

$$\therefore 3a = 21$$

$$a = 7$$

$$\text{and } 3a^2 + 2d^2 = 165 \Rightarrow 3(7)^2 + 2d^2 = 165 \Rightarrow 2d^2 = 18$$

$$\Rightarrow d^2 = 9$$

$$\Rightarrow d = \pm 3$$

Thus,  $a = 7$  and  $d = \pm 3$

Hence, the required numbers are (4, 7, 10) or (10, 7, 4)

Question 7:

Let the required angles be  $(a - 3d)^\circ$ ,  $(a - d)^\circ$ ,  $(a + d)^\circ$  and  $(a + 3d)^\circ$

Common difference =  $(a - d) - (a - 3d) = a - d - a + 3d = 2d$

Common difference =  $10^\circ$

$$\therefore 2d = 10^\circ = d = 5^\circ$$

Sum of four angles of quadrilateral =  $360^\circ$

$$(a - 3d)^\circ, (a - d)^\circ, (a + d)^\circ \text{ and } (a + 3d)^\circ = 360^\circ$$

$$4a = 360^\circ$$

$$a = 90^\circ$$

$$\therefore a = 90^\circ, d = 5^\circ$$

$$\text{First angle} = (a - 3d)^\circ = (90 - 3 \times 5)^\circ = 75^\circ$$

$$\text{Second angle} = (a - d)^\circ = (90 - 5)^\circ = 85^\circ$$

$$\text{Third angle} = (a + d)^\circ = (90 + 5)^\circ = 95^\circ$$

$$\text{Fourth angle} = (a + 3d)^\circ = (90 + 3 \times 5)^\circ = 105^\circ$$

Question 8:

Let the required number be  $(a - 3d)$ ,  $(a - d)$ ,  $(a + d)$  and  $(a + 3d)$

Sum of these numbers =  $(a - 3d) + (a - d) + (a + d) + (a + 3d)$

$$\therefore 4a = 28 \Rightarrow a = 7$$

Sum of the squares of these numbers

$$= (a - 3d)^2 + (a - d)^2 + (a + d)^2 + (a + 3d)^2 = 4(a^2 + 5d^2)$$

$$\therefore 4(a^2 + 5d^2) = 216$$

$$\Rightarrow a^2 + 5d^2 = 54 \quad [\text{since } a = 7]$$

$$\Rightarrow 5d^2 = 54 - 49$$

$$\Rightarrow 5d^2 = 5$$

$$\Rightarrow d^2 = 1$$

$\Rightarrow d = \pm 1$

Hence, the required numbers (4, 6, 8, 10)

\*\*\*\*\* END \*\*\*\*\*