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) × a × (a + d) = $a(a^2 - d^2)$
But sum = 24 and product = 440
∴ 3a = 24 ⇒ a = 8
and $a(a^2 - d^2) = 8\ (64 - d^2) = 440$
⇒ $64 - d^2 = 55$
⇒ $d^2 = 9$
⇒ 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
∴ 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
∴ 3a = 21
a = 7
and $3a^2 + 2d^2 = 165 \Rightarrow 3(7)^2 + 2d^2 = 165 \Rightarrow 2d^2 = 18$
⇒ $d^2 = 9$
⇒ d = ±3
Thus, a = 7 and d = ±3
Hence, the required numbers are (4, 7, 10) or (10, 7, 4)

Question 7:
Let the required angles be (a - 3d)°, (a - d) °, (a + d) ° and (a + 3d) °
Common difference = (a - d) - (a - 3d) = a - d - a + 3d = 2d
Common difference = 10°
∴ 2d = 10° = d = 5°
Sum of four angles of quadrilateral = 360°
(a - 3d)°, (a - d) °, (a + d) ° and (a + 3d) ° = 360°
4a = 360°
a = 90°
∴ a = 90° d = 5°
First angle = (a - 3d)° = (90 - 3 × 5) ° = 75°
Second angle = (a - d)° = (90 - 5) ° = 85°
Third angle = (a + d)° = (90 + 5°) = 95°
Fourth angle = (a + 3d)° = (90 + 3 × 5)° = 105°

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)
∴ 4a = 28 ⇒ a = 7
Sum of the squares of these numbers
$= (a - 3d)^2 + (a - d)^2 + (a + d)^2 + (a + 3d)^2 = 4(a^2 + 5d^2)$
∴ $4(a^2 + 5d^2) = 216$
⇒ $a^2 + 5d^2 = 54$ [since a = 5]
⇒ $5d^2 = 54 - 49$
⇒ $5d^2 = 5$
⇒ $d^2 = 1$

$\Rightarrow d = \pm 1$
Hence, the required numbers (4, 6, 8, 10)

********** END **********