Exercise 11B

Question 1:
If T_1, T_2, T_3 are consecutive terms of an AP, then
$T_2 - T_1 = T_3 - T_2$ or $2T_2 = T_1 + T_3$
$\therefore$ x+2, 2x, 2x + 3 are in AP, if
$2(2x) = x + 2 + 2x + 3$
$\Rightarrow 4x = 3x + 5 \Rightarrow x = 5$

Question 2:
Let the required numbers 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 = 15 and product = 80
$\therefore$ $3a = 15 \Rightarrow a = 5$
and $a(a^2 - d^2) = 5 \times (25 - d^2) = 80$ [$\because a = 5$]
$\Rightarrow (25 - d^2) = 16$
$\Rightarrow d^2 = 25 - 16 \Rightarrow d^2 = 9$
$\Rightarrow d = 3$
Thus, a = 5 and d = 3
Hence, the required numbers are (2, 5, 8)

Question 3:
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 = 27 and product = 405
$\therefore$ $3a = 27 \Rightarrow a = 9$
and $a(a^2 - d^2) = 405$
$\Rightarrow 9 \times (81 - d^2) = 405$ [$\because a = 5$]
$\Rightarrow 729 - 9d^2 = 405$
$\Rightarrow 9d^2 = 729 - 405 = 324$
$\Rightarrow d^2 = 36$
$d = \pm 6$
a = 9 and d = 6
Hence the required numbers are (3, 9, 15)

Question 4:
Let the required numbers be (a - d), a, (a + d)
Sum of these number = (a - d) + a + (a + d) = 3a
Product of these numbers = (a - d) × a × (a + d) = $a(a^2 - d^2)$
$\therefore$ $3a = 3 \Rightarrow a = 1$
and $a(a^2 - d^2) = 1 (1 - d^2) = -35$
$\Rightarrow 1 - d^2 = -35$
$\Rightarrow d^2 = 36$
$\Rightarrow d = 6$
But, sum = 3 and product = - 35
Thus, a = 1 and d = 6
Hence, the required numbers are (-5, 1, 7)

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