Important Questions for CBSE Class 10 Mathematics/Arithmetic Progressions/Chapter 5/Model Questions.

Answer the following:

1. Write first four terms of the AP when the first term 'a' and the common difference 'd' are given as follows:

i) a = 4, d= -2

ii) a = -1, d= 5

Solution:

i) Here a_1= 4

a_2 = 4 + (-2) = 2

a_3 = 2 + (-2) = 0

a_4 = 0 + (-2) = -2

ii) Here a_1= -1

a_2 = (-1) + 5 = 4

a_3 = 4 + 5 = 9

a_4 = 9 + 5 = 14

2. For the following AP's write the first term and common difference.

i) 0, -4, -8, -12 …….

ii) 2, 7, 12 ……..

Solution:

i) a_1= 0

d= (-4) – 0 = -4

ii) a_1= 2

d = 7 – 2 = 5

3. Which of the following is an AP? If they form an AP, find the common difference 'd' and write three more terms?

i) 2, 4, 8, 16 ……

ii) a, 2a, 3a, 4a ……

Solution:

i) $a_2 - a_1$= 4 – 2= 2

a_3 - a_2= 8 – 4 = 4

Here$a_2 - a_1 \neq a_3 - a_2$. So it does not form an AP.

ii) $a_2 - a_1$= 2a – a = a

a_3 - a_2= 3a – 2a = a

$a_4 - a_3$ = 4a – 3a = a

Here $a_2 - a_1 \neq a_3 - a_2$. So it forms an AP.

4. Find the 25th term of the AP: 10, 7, 4, 1…….

Solution:

a_n = a + (n-1) d

a_{25} = 10 + (25 – 1) (-3) = 10 + 24 $\times$ (-3) = 10 + (-72) = -62

5. Which term of the AP 3, 8, 13, 18 ……. is 78?

Solution:

a_n = 78, a = 3, d = 8 – 3 = 5

Given a + (n – 1) d = 78

3 + (n -1) 5 = 78

3 + 5n – 5 = 78

5n – 5 = 78 – 3 = 75

5n = 80

n = $\frac{80}{5}$ = 16

6. Find the number of terms in the AP: 3, 8, 13, ---------- 253.

Solution:

Here a = 3, d = 8 – 3 = 5, a_n= 253

a_n = a + (n – 1) d

253 = 3 + (n – 1) 5

253 = 3 + 5n – 5

253 – 3 = 5n – 5

250 = 5n – 5

255 = 5n

n = $\frac{255}{5}$ = 51.

7. Find the 31st term of an AP whose 11th term is 38 and the 16th term is 73.

Solution:

Given a_{11}= 38, a_{16}= 73

a + 10d = 38

a + 15d = 73

Solve these two equations, we get

-5d = 38 – 73 = -35

d = $\frac{-35}{-5}$ = 7

Substitute d = 7 in a + 10d = 38

a + 10 $\times$ 7 = 38

a + 70 = 38

a = 38 – 70 = -32

a_{31} = a + 30d = (-32) + 30 $\times$ 7

a_{31}= (-32) + 210 = 178.
