

## Homework

14 The common difference of the A.P. whose general term  $a_n = 2n + 1$  is:-

$$a_1 = 2(1) + 1 = 3$$

$$a_2 = 2(2) + 1 = 5$$

$$d = a_2 - a_1 = 5 - 3 = 2 \quad (b)$$

24 The number of terms in the A.P. 2, 5, 8, ..., 59 is  
 $a_n = 59$        $d = 5 - 2 = 3$

$$\Rightarrow a + (n-1)d = 59$$

$$\Rightarrow 2 + (n-1)3 = 59$$

$$\Rightarrow n-1 = \frac{57}{3} = 19$$

$$\Rightarrow n = 19 + 1 = 20 \quad (c)$$

34 The first positive term of the A.P. -11, -8, -5, ... is

$$d = -8 + 11 = 3$$

$$\textcircled{a} \quad -11 + (n-1)3 > 0$$

$$\Rightarrow -11 + 3n - 3 > 0$$

$$\Rightarrow 3n - 14 > 0$$

$$\Rightarrow n > \frac{14}{3} = 4.66 \quad \textcircled{b}$$

$\therefore \boxed{n=5}$ , nearest value

$$\begin{aligned} \therefore & -11 + (5-1)3 \\ & = -11 + 12 = 1 \end{aligned} \quad (a)$$

44 The 4<sup>th</sup> term from the end of the A.P. 2, 5, 8, ... 35 is

$$d = 5 - 2 = 3$$

$$l = 35, \quad n = 4$$

$$\begin{aligned} \therefore l_4 &= l - (n-1)d \\ &= 35 - 3(3) \\ &= 35 - 9 = 26 \quad (b) \end{aligned}$$

54 The 11<sup>th</sup> & 13<sup>th</sup> terms of an A.P are 35 and 41 respectively its common difference is -

$$a_{11} = 35$$

$$a_{13} = 41$$

$$\therefore a + 10d = 35$$

$$a + 12d = 41$$

$$\Rightarrow 2d = 6$$

$$\Rightarrow d = 3 \quad (d)$$

64 The next term of the A.P  $\sqrt{8}, \sqrt{18}, \sqrt{32}, \dots$  is

$$d = \sqrt{18} - \sqrt{8} = 3\sqrt{2} - 2\sqrt{2} = \sqrt{2}$$

$$a = \sqrt{8}$$

$$a_4 = 2\sqrt{8} + (4-1)\sqrt{2}$$

$$= 2\sqrt{2} + 3\sqrt{2} = 5\sqrt{2} \quad (a)$$

74 If for an A.P.  $a_5 = a_{10} = 5a$ , then  $a_{15}$  is

$$a + 4d = 5a \Rightarrow$$

$$a + 9d = 5a$$

$$\Rightarrow 5d = 0$$

$$\Rightarrow d = 0$$

$$\therefore a_{15} = a + 14d$$

84 Which of the following is not an A.P.?

(b) 3, 7, 12, 18

94 The sum of first 20 odd natural numbers is

$$a_n = 39$$

$$n = 20$$

$$d = 2$$

$$a = 1$$

$$\begin{aligned} \therefore S_{20} &= \frac{20}{2} [2 + 19(2)] \\ &= 20 + 380 \\ &= 400 \text{ (c)} \end{aligned}$$

104 The sum of first 20 natural numbers.

$$AP = 1 + 2 + \dots$$

$$S_{20} = 1 + 2 + \dots + 20$$

$$\therefore S_{20} = \frac{20(20+1)}{2} = \frac{20 \times 21}{2} = 210 \text{ (d)}$$