

Home Assignment

The common difference of the AP whose general term is $a_n = 2n + 1$ is
(a) 2 (b) 1 (c) -2 (d) -1

Given: General term $a_n = 2n + 1$

Solution :- put $n = 1$, $a_1 =$ first term of AP

$$a_1 = 2n + 1$$

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

$$a_1 = 3$$

put $n = 2$, $a_2 =$ second term of AP

$$a_2 = 2n + 1$$

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

$$a_2 = 5$$

$$d = a_2 - a_1$$

$$d = 5 - 3$$

$$d = 2$$

Hence, common difference is 2
Hence, option (b) is the correct answer.

The number of terms in the AP 2, 5, 8, ..., 59 is

(a) 12 (b) 19 (c) 20 (d) 25

Given AP: 2, 5, 8, ..., 59

$a = 2$, $d = 3$, $a_n = 59$, $n = ?$

$$n = \frac{a_n - a}{d} + 1$$

$$n = \frac{59 - 2}{3} + 1$$

$$n = \frac{57}{3} + 1$$

$$n = 20$$

Hence, no. of terms is 20.

Hence, the correct option is C.

③ The first positive terms of the AP
-11, -8, -5, ...

(a) 1 (b) 3 (c) -2 (d) -4
sol Given

$$a = -11, d = -8 - (-11)$$

$$d = 3$$

$$a_n > 0$$

$$= a + (n-1)d > 0$$

$$= -11 + (n-1) \times 3 > 0$$

$$= -11 + 3n - 3 > 0$$

$$= 3n - 14 > 0$$

$$= n > 14/3$$

$$= n > 4.66$$

$$n = 5 \text{ (positive term)}$$

$$a_n = a + (n-1)d$$

$$= -11 + (5-1) \times 3$$

$$= -11 + 12$$

$$= 1$$

Hence 1 is the first positive term

④ The 4th term from the end of
the AP 2, 5, 8, ... 35 is

(a) 29 (b) 26 (c) 23 (d) 20
sol Given AP 2, 5, 8, ... 35

$$2, 5, 8, 11, \dots, 29, 32, 35$$

Reverse AP: 35, 32, 29, ... 5, 2

$$a_1 = 35$$

$$d = a_2 - a_1$$

$$= 32 - 35$$

$$= -3$$

$$A_n = a + (n-1)d$$

$$a_4 = 35 + (4-1) \cdot 3$$

$$a_4 = 35 + 9$$

$$a_4 = 26$$

5) The 11th and 13th terms of an AP are 35 and 41 respectively. Its common difference is

(a) 38 (b) 32 (c) 6 (d) 3

~~sol~~ Let a be the first term and d be the common difference.

$$11^{\text{th}} \text{ term} = 35$$

$$\Rightarrow a + 10d = 35 \quad \text{--- (i)}$$

$$13^{\text{th}} \text{ term} = 41$$

$$\Rightarrow a + 12d = 41 \quad \text{--- (ii)}$$

Solving eq. (i) and (ii)

$$a + 12d = 41$$

$$a + 10d = 35$$

$$2d = 6$$

$$d = 6/2$$

$$d = 3$$

6 The next term of the AP $\sqrt{8}, \sqrt{18}, \sqrt{32}, \dots$ is

- (a) $5\sqrt{2}$ (b) $5\sqrt{3}$ (c) $3\sqrt{3}$ (d) $4\sqrt{3}$

Sol: Given AP is $\sqrt{8}, \sqrt{18}, \sqrt{32}, \dots$
 This can be written as $2\sqrt{2}, 3\sqrt{2}, 4\sqrt{2}, \dots$

$\Rightarrow 2\sqrt{2}, 3\sqrt{2}, 4\sqrt{2}$

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

$d = \sqrt{2}$

next term of the AP = ~~$4\sqrt{2} + d$~~ $4\sqrt{2} + d$

$= 4\sqrt{2} + \sqrt{2}$

$= 5\sqrt{2}$

Hence $5\sqrt{2}$ is the next term

8) Which of the following is not an AP?

- (a) 1, 4, 7, ... (b) 3, 7, 12, 18, ...
(c) 11, 14, 17, 20, ... (d) -5, -2, 1, 4, ...

soln for opt a

Given AP: 1, 4, 7, ...

$$d = a_2 - a_1 = a_3 - a_2$$

$$= 4 - 1 = 7 - 4$$

$$= 3 = 3$$

Hence, it is an AP.

for opt b

$$d = a_2 - a_1 = a_3 - a_2$$

$$d = 7 - 3 = 18 - 12$$

$$= 4 \neq 6$$

Hence, it is not an AP.

for opt c

$$d = a_2 - a_1 = a_3 - a_2 = a_4 - a_3$$

$$d = 14 - 11 = 20 - 17$$

$$= 3 = 3$$

Hence, it is an AP.

for opt d

$$d = a_2 - a_1 = a_3 - a_2 = a_4 - a_3$$

$$d = -2 - (-5) = 4 - 1$$

$$d = -2 + 5 = 3$$

$$d = 3 = 3$$

Hence, it is an AP.

So, the correct answer is opt b.

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The sum of first 20 odd natural numbers is

(a) 281 (b) 385 (c) 400 (d) 421
Sol Odd natural numbers are in the pattern 1, 3, 5, 7, 9, ...

Here, $a = 1$

$$d = a_2 - a_1$$

$$d = 3 - 1$$

$$d = 2$$

$$n = 20$$

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

$$= \frac{20}{2} [(2(1) + (20-1)2)]$$

$$= 10 \times (2 + 19 \times 2)$$

$$= 10 \times 40$$

$$= 400$$

Hence, opt c is correct.

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The sum of first 20 natural number

(a) 110 (b) 170 (c) 190 (d) 210
Sol Sum of first 20 natural

$$\text{number} = \frac{n(n+1)}{2}$$

$$= \frac{20(20+1)}{2}$$

$$= \frac{10 \times 21}{1}$$

$$= 210$$

Hence, d is the correct answer.