

## EXERCISE 5.1

Choose the correct answer from the given four options in the following questions:

1. In an AP, if  $d = -4$ ,  $n = 7$ ,  $a_n = 4$ , then  $a$  is

- (A) 6            (B) 7            (C) 20            (D) 28

**Solution:**

**(D) 28**

Explanation:

We know that  $n$ th term of an AP is

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

where,

$a$  = first term

$a_n$  is  $n$ th term

$d$  is the common difference

According to the question,

$$4 = a + (7 - 1)(-4)$$

$$4 = a - 24$$

$$a = 24 + 4 = 28$$

2. In an AP, if  $a = 3.5$ ,  $d = 0$ ,  $n = 101$ , then  $a_n$  will be

- (A) 0            (B) 3.5            (C) 103.5            (D) 104.5

**Solution:**

**(B) 3.5**

Explanation:

We know that  $n$ th term of an AP is

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

Where,

$a$  = first term

$a_n$  is  $n$ th term

$d$  is the common difference

$$a_n = 3.5 + (101 - 1)0$$

$$= 3.5$$

(Since,  $d = 0$ , it's a constant A.P)

3. The list of numbers  $-10, -6, -2, 2, \dots$  is

- (A) an AP with  $d = -16$   
 (B) an AP with  $d = 4$   
 (C) an AP with  $d = -4$   
 (D) not an AP

**Solution:**

**(B) an AP with  $d = 4$**

Explanation:

According to the question,

$$a_1 = -10$$

$$a_2 = -6$$

$$a_3 = -2$$

$$a_4 = 2$$

$$a_2 - a_1 = 4$$

$$a_3 - a_2 = 4$$

$$a_4 - a_3 = 4$$

$$a_2 - a_1 = a_3 - a_2 = a_4 - a_3 = 4$$

Therefore, it's an A.P with  $d = 4$

4. The 11th term of the AP:  $-5, (-5/2), 0, 5/2, \dots$  is

- (A)  $-20$       (B)  $20$       (C)  $-30$       (D)  $30$

Solution:

(B)  $20$

Explanation:

First term,  $a = -5$

Common difference,

$$d = 5 - (-5/2) = 5/2$$

$$n = 11$$

We know that the  $n$ th term of an AP is

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

Where,

$a$  = first term

$a_n$  is  $n$ th term

$d$  is the common difference

$$a_{11} = -5 + (11 - 1)(5/2)$$

$$a_{11} = -5 + 25 = 20$$

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5. The first four terms of an AP, whose first term is  $-2$  and the common difference is  $-2$ , are

(A)  $-2, 0, 2, 4$

(B)  $-2, 4, -8, 16$

(C)  $-2, -4, -6, -8$

(D)  $-2, -4, -8, -16$

Solution:

(C)  $-2, -4, -6, -8$

Explanation:

First term,  $a = -2$

Second Term,  $d = -2$

$$a_1 = a = -2$$

We know that the  $n$ th term of an AP is

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

Where,

$a$  = first term

$a_n$  is  $n$ th term

$d$  is the common difference

Hence, we have,

$$a_2 = a + d = -2 + (-2) = -4$$

Similarly,

$a_3 = -6$   
 $a_4 = -8$   
 So the A.P is  
 $-2, -4, -6, -8$

**6. The 21st term of the AP whose first two terms are  $-3$  and  $4$  is**

- (A) 17      (B) 137      (C) 143      (D)  $-143$

**Solution:**

**(B) 137**

Explanation:

First two terms of an AP are  $a = -3$  and  $a_2 = 4$ .

We know, nth term of an AP is

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

Where,

$a$  = first term

$a_n$  is nth term

$d$  is the common difference

$$a_2 = a + d$$

$$4 = -3 + d$$

$$d = 7$$

Common difference,  $d = 7$

$$a_{21} = a + 20d$$

$$= -3 + (20)(7)$$

$$= 137$$

**7. If the 2nd term of an AP is 13 and the 5th term is 25, what is its 7<sup>th</sup> term?**

- (A) 30      (B) 33      (C) 37      (D) 38

**Solution:**

**(B) 33**

Explanation:

We know that the nth term of an AP is

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

Where,

$a$  = first term

$a_n$  is nth term

$d$  is the common difference

$$a_2 = a + d = 13 \dots\dots(1)$$

$$a_5 = a + 4d = 25 \dots\dots(2)$$

From equation (1) we have,

$$a = 13 - d$$

Using this in equation (2), we have

$$13 - d + 4d = 25$$

$$13 + 3d = 25$$

$$3d = 12$$

$$d = 4$$

$$a = 13 - 4 = 9$$

$$\begin{aligned}a_7 &= a + 6d \\ &= 9 + 6(4) \\ &= 9 + 24 = 33\end{aligned}$$

8. Which term of the AP: 21, 42, 63, 84... is 210?

- (A) 9<sup>th</sup>      (B) 10<sup>th</sup>      (C) 11<sup>th</sup>      (D) 12<sup>th</sup>

Solution:

(B) 10<sup>th</sup>

Explanation:

Let nth term of the given AP be 210.

According to question,

first term,  $a = 21$

common difference,  $d = 42 - 21 = 21$  and  $a_n = 210$

We know that the nth term of an AP is

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

Where,

$a$  = first term

$a_n$  is nth term

$d$  is the common difference

$$210 = 21 + (n - 1)21$$

$$189 = (n - 1)21$$

$$n - 1 = 9$$

$$n = 10$$

So, 10th term of an AP is 210.

9. If the common difference of an AP is 5, then what is  $a_{18} - a_{13}$ ?

- (A) 5      (B) 20      (C) 25      (D) 30

Solution:

(C) 25

Explanation:

Given, the common difference of AP i.e.,  $d = 5$

Now,

As we know, nth term of an AP is

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

where  $a$  = first term

$a_n$  is nth term

$d$  is the common difference

$$a_{18} - a_{13} = a + 17d - (a + 12d)$$

$$= 5d$$

$$= 5(5)$$

$$= 25$$