NUMBER PATTERNS 1: QUIZ SOLUTIONS

Question 1

Which of the following is an arithmetic sequence?

A. 1; 2; 4; 8; . . . B. -3; 1; 5; 9; . . .

C. 9; 3; 1; $\frac{1}{3}$; . . . D. 1; 1; 2; 3; . . .

Solution

For A, pattern is: $1\times 2=2;\quad 2\times 2=4;\quad 4\times 2=8;\quad \Rightarrow$ not an arithmetic sequence.

For B, pattern is: $-3+4=1;\quad 1+4=5;\quad 5+4=9;\quad \Rightarrow$ arithmetic sequence

For C, pattern is: $9\div 3=3;\quad 3\div 3=1;\quad 1\div 3=\frac{1}{3}\Rightarrow$ not an arithmetic sequence

For D, pattern is:

$0+1=1;\quad 1+1=2;\quad 1+2=3;\quad \Rightarrow$ not an arithmetic sequence (Fibonacci sequence)

So, the correct option is B.

Question 2

If the general term of an arithmetic sequence is $T_n=3n+4$, what are the first three terms?

A. 7; 11; 15 B. 4; 7; 10 C. 1; 4; 7 D. 7; 10; 13

Solution

$$T_n=3n+4$$
$$\therefore\ T_1=3(1)+4=3+4=7$$
$$\therefore\ T_2=3(2)+4=6+4=10$$
$$\therefore\ T_3=3(3)+4=9+4=13$$

So, the correct option is D.

Question 3

What is the general term of the arithmetic sequence 6; 3; 0; . . .?

A. $9-3n$ B. $3n-9$ C. $n+3$ D. $9+3n$

Solution

For the sequence 6; 3; 0; . . , a = 6, d = -3.

$$\therefore\ T_n=6+(n-1)(-3)$$
$$=6-3n+3$$
$$=9-3n$$

So, the correct option is A.

Question 4

What is the 100th term of the arithmetic sequence 6; 11; 16; . . .?

A. 106 B. 495 C. 501 D. 600

Solution

For the sequence 6; 11; 16; . . , $a = 6$, $d = 5$.

$$\therefore T_{100} = 6 + 99 \times 5$$
$$= 6 + 495$$
$$= 501$$

So, the correct option is C.

Question 5

If the first three terms of an arithmetic sequence are $3a - 4$, $4a - 3$ and $7a - 6$, what is the value of a?

A. -2 B. $\frac{1}{2}$ C. 1 D. 2

Solution

$T_1 = 3a - 4$, $T_2 = 4a - 3$, $T_3 = 7a - 6$

$$d = T_1 - T_2 = T_2 - T_3 \quad \text{or use } d = T_2 - T_1 = T_3 - T_2$$
$$\therefore (4a - 3) - (3a - 4) = (7a - 6) - (4a - 3)$$
$$\therefore a + 1 = 3a - 3$$
$$\therefore 2a = 4$$
$$\therefore a = 2$$

So, the correct option is D.