

NUMBER PATTERNS 5: QUIZ SOLUTIONS

Question 1

Expand $\sum_{r=3}^5 (r+1)$.

- A. $4 + 5 + 6$ B. $3 + 4 + 5$ C. $2 + 3 + 4$ D. $1 + 2 + 3$

Solution

$$\sum_{r=3}^5 (r+1) = (3+1) + (4+1) + (5+1) = 4 + 5 + 6.$$

So, the correct answer is A.

Question 2

Evaluate $\sum_{i=1}^4 (-i)^i$.

- A. 4 B. 2 C. 1 D. 0

Solution

$$\begin{aligned} \sum_{i=1}^4 (-1)^i &= (-1)^1 + (-1)^2 + (-1)^3 + (-1)^4 \\ &= -1 + 1 - 1 + 1 \\ &= 0 \end{aligned}$$

So, the correct answer is D.

Question 3

How many terms are there in the expansion of $\sum_{n=0}^4 3^n$?

- A. 3 B. 4 C. 5 D. 6

Solutions

$$\sum_{n=0}^4 3^n = 3 + 3 + 3 + 3 + 3 \text{ . i.e., 5 terms}$$

$n=0$ $n=1$ $n=2$ $n=3$ $n=4$

So, the correct answer is C.

Question 4

Write the series $4 + 9 + 16 + \dots$ using sigma notation.

- A. $\sum_{r=1}^n r^2$ B. $\sum_{r=2}^{\infty} r^2$ C. $\sum_{r=1}^3 r^2$ D. $\sum_{r=4}^{\infty} r^2$

Solution

$$4 + 9 + 16 + \dots = \sum_{r=2}^{\infty} r^2$$

So, the correct answer is B.

Question 5

What is the value of $\sum_{i=1}^3 2i - \sum_{i=1}^3 1$?

- A. 3 B. 6 C. 9 D. 12

Solution

$$\sum_{i=1}^3 2i = 2(1) + 2(2) + 2(3) = 2 + 4 + 6 = 12$$

$$\sum_{i=1}^3 1 = 1 + 1 + 1 = 3$$

$$\therefore \sum_{i=1}^3 2i - \sum_{i=1}^3 1 = 12 - 3 = 9$$

OR

$$\begin{aligned} \therefore \sum_{i=1}^3 2i - \sum_{i=1}^3 1 &= \sum_{i=1}^3 (2i - 1) = [2(1) - 1] + [2(2) - 1] + [2(3) - 1] \\ &= 1 + 3 + 5 = 9 \end{aligned}$$

So, the correct answer is C.