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Write the first five terms of each of the sequences in Exercises 1 to 6 whose nth terms are:

1. $a_n = n (n + 2)$

Solution:

Given,

n^{th} term of a sequence $a_n = n (n + 2)$

On substituting n = 1, 2, 3, 4, and 5, we get the first five terms

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

$a_2 = 2(2 + 2) = 8$

$a_3 = 3(3 + 2) = 15$

$a_4 = 4(4 + 2) = 24$

$a_5 = 5(5 + 2) = 35$

Hence, the required terms are 3, 8, 15, 24, and 35.

2. $a_n = n/n+1$

Solution:

Given n^{th} term, $a_n = n/n+1$

On substituting n = 1, 2, 3, 4, 5, we get

$$a_1 = \frac{1}{1+1} = \frac{1}{2},\ a_2 = \frac{2}{2+1} = \frac{2}{3},\ a_3 = \frac{3}{3+1} = \frac{3}{4},\ a_4 = \frac{4}{4+1} = \frac{4}{5},\ a_5 = \frac{5}{5+1} = \frac{5}{6}$$

Hence, the required terms are 1/2, 2/3, 3/4, 4/5 and 5/6.

3. $a_n = 2^n$

Solution:

Given n^{th} term, $a_n = 2^n$

On substituting n = 1, 2, 3, 4, 5, we get

$a_1 = 2^1 = 2$

$a_2 = 2^2 = 4$

$a_3 = 2^3 = 8$

$a_4 = 2^4 = 16$

$a_5 = 2^5 = 32$

Hence, the required terms are 2, 4, 8, 16, and 32.

4. $a_n = (2n – 3)/6$

Solution:

Given n^{th} term, $a_n = (2n – 3)/6$

On substituting n = 1, 2, 3, 4, 5, we get

$$a_1 = \frac{2\times 1-3}{6} = \frac{-1}{6}$$

$$a_2 = \frac{2\times 2-3}{6} = \frac{1}{6}$$

$$a_3 = \frac{2\times 3-3}{6} = \frac{3}{6} = \frac{1}{2}$$

$$a_4 = \frac{2\times 4-3}{6} = \frac{5}{6}$$

$$a_5 = \frac{2\times 5-3}{6} = \frac{7}{6}$$

Hence, the required terms are -1/6, 1/6, 1/2, 5/6 and 7/6..

5. $a_n = (-1)^{n-1}\ 5^{n+1}$

Solution:

Given n^{th} term, $a_n = (-1)^{n-1}\ 5^{n+1}$

On substituting n = 1, 2, 3, 4, 5, we get

$$a_1 = (-1)^{1-1}\ 5^{1+1} = 5^2 = 25$$

$$a_2 = (-1)^{2-1}\ 5^{2+1} = -5^3 = -125$$

$$a_3 = (-1)^{3-1}\ 5^{3+1} = 5^4 = 625$$

$$a_4 = (-1)^{4-1}\ 5^{4+1} = -5^5 = -3125$$

$$a^5 = (-1)^{5-1}\ 5^{5+1} = 5^6 = 15625$$

Hence, the required terms are 25, –125, 625, –3125, and 15625.

6.

$$a_n = n\frac{n^2+5}{4}$$

Solution:

On substituting *n* = 1, 2, 3, 4, 5, we get first 5 terms

$$a_1 = 1\cdot\frac{1^2+5}{4} = \frac{6}{4} = \frac{3}{2}$$

$$a_2 = 2\cdot\frac{2^2+5}{4} = 2\cdot\frac{9}{4} = \frac{9}{2}$$

$$a_3 = 3\cdot\frac{3^2+5}{4} = 3\cdot\frac{14}{4} = \frac{21}{2}$$

$$a_4 = 4\cdot\frac{4^2+5}{4} = 21$$

$$a_5 = 5\cdot\frac{5^2+5}{4} = 5\cdot\frac{30}{4} = \frac{75}{2}$$

Hence, the required terms are 3/2, 9/2, 21/2, 21 and 75/2.

Find the indicated terms in each of the sequences in Exercises 7 to 10 whose n^{th} terms are:

7. $a_n = 4n – 3$; a_{17}, a_{24}

Solution:

Given,

n^{th} term of the sequence is $a_n = 4n – 3$

On substituting *n* = 17, we get

$a_{17} = 4(17) – 3 = 68 – 3 = 65$

Next, on substituting *n* = 24, we get

$a_{24} = 4(24) – 3 = 96 – 3 = 93$

8. $a_n = n^2/2^n$; a^7

Solution:

Given,

n^{th} term of the sequence is $a_n = n^2/2^n$

Now, on substituting *n* = 7, we get

$a_7 = 7^2/2^7 = 49/ 128$

9. $a_n = (-1)^{n-1} n^3$; a_9

Solution:

Given,

*n*th term of the sequence is $a_n = (-1)^{n-1} n^3$

On substituting *n* = 9, we get

$a_9 = (-1)^{9-1} (9)^3 = 1 \times 729 = 729$

$a_n = \frac{n(n-2)}{n+3}; a_{20}$