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1. Find which of the following sequence form a G.P.:
(i) 8, 24, 72, 216, ………
(ii) 1/8, 1/24, 1/72, 1/216, ………
(iii) 9, 12, 16, 24, ………
Solution:

(i) Given sequence: 8, 24, 72, 216, ………
Since,
24/8 = 3, 72/24 = 3, 216/72 = 3
⇒ 24/8 = 72/24 = 216/72 = ……….. = 3
Therefore 8, 24, 72, 216, ……… is a G.P. with a common ratio 3.

(ii) Given sequence: 1/8, 1/24, 1/72, 1/216, ………
Since,
(1/24)/ (1/8) = 1/3, (1/72)/ (1/24) = 1/3, (1/216)/ (1/72) = 1/3
⇒ (1/24)/ (1/8) = (1/72)/ (1/24) = (1/216)/ (1/72) = ……….. = 1/3
Therefore 1/8, 1/24, 1/72, 1/216, ……… is a G.P. with a common ratio 1/3.

(iii) Given sequence: 9, 12, 16, 24, ………
Since,
12/9 = 4/3; 16/12 = 4/3; 24/16 = 3/2
12/9 = 16/12 ≠ 24/16
Therefore, 9, 12, 16, 24 …… is not a G.P.

2. Find the 9th term of the series: 1, 4, 16, 64, …..
Solution:

It's seen that, the first term is (a) = 1
And, common ratio(r) = 4/1 = 4
We know that, the general term is
$t_n = ar^{n-1}$
Thus,
$t_9 = (1)(4)^{9-1} = 4^8 = 65536$

3. Find the seventh term of the G.P: 1, √3, 3, 3 √3, …..
Solution:

It's seen that, the first term is (a) = 1
And, common ratio(r) = √3/1 = √3
We know that, the general term is
$t_n = ar^{n-1}$
Thus,
$t_7 = (1)(\sqrt{3})^{7-1} = (\sqrt{3})^6 = 27$

4. Find the 8th term of the sequence:

$$\frac{3}{4}, 1\frac{1}{2}, 3, \ldots\ldots\ldots$$

Solution:

The given sequence can be rewritten as,
3/4, 3/2, 3, …..
It's seen that, the first term is (a) = 3/4
And, common ratio(r) = (3/2)/ (3/4) = 2
We know that, the general term is
$t_n = ar^{n-1}$
Thus,
$t_8 = (3/4)(2)^{8-1} = (3/4)(2)^7 = 3 \times 2^5 = 3 \times 32 = 96$

5. Find the 10th term of the G.P. :

$$12, 4, 1\frac{1}{3}, \ldots\ldots\ldots$$

Solution:

The given sequence can be rewritten as,
12, 4, 4/3, …..
It's seen that, the first term is (a) = 12
And, common ratio(r) = (4)/ (12) = 1/3
We know that, the general term is
$t_n = ar^{n-1}$
Thus,
$t_{10} = (12)(1/3)^{10-1} = (12)(1/3)^9 = 12 \times 1/(19683) = 4/ 6561$

6. Find the nth term of the series:
1, 2, 4, 8, ……..
Solution:

It's seen that, the first term is (a) = 1
And, common ratio(r) = 2/ 1 = 2
We know that, the general term is
$t_n = ar^{n-1}$
Thus,
$t_n = (1)(2)^{n-1} = 2^{n-1}$