

7.4 - Geometric Sequences

Determine if the sequence is geometric. If it is, find the common ratio, the term named in the problem, and the explicit formula.

1) $-3, 12, -48, 192, \dots$
Find a_9

2) $-3, -6, -12, -24, \dots$
Find a_{12}

3) $-2, 6, -18, 54, \dots$
Find a_{11}

4) $2, 6, 18, 54, \dots$
Find a_9

5) $1, 2, 6, 24, \dots$
Find a_{10}

6) $4, 16, 36, 64, \dots$
Find a_{10}

7) $18, 10, 6, 4, \dots$
Find a_{11}

8) $-1, 4, -16, 64, \dots$
Find a_9

9) $-4, -8, -16, -32, \dots$
Find a_{12}

10) $35, 356, 3566, 35666, \dots$
Find a_{11}

Given the explicit formula for a geometric sequence find the first five terms.

11) $a_n = -2 \cdot (-3)^{n-1}$

12) $a_n = -4 \cdot (-2)^{n-1}$

13) $a_n = (-6)^{n-1}$

14) $a_n = -(-6)^{n-1}$

15) $a_n = 2 \cdot 6^{n-1}$

16) $a_n = -3 \cdot 5^{n-1}$

Evaluate each geometric series described.

17) $2 + 6 + 18 + 54 \dots, n = 6$

18) $1 + 4 + 16 + 64 \dots, n = 7$

19) $2 + 8 + 32 + 128 \dots, n = 9$

20) $1 + 6 + 36 + 216 \dots, n = 7$

21) $1 + 3 + 9 + 27\dots, n = 9$

22) $2 + 8 + 32 + 128\dots, n = 6$

23) $1 + 3 + 9 + 27\dots, n = 8$

24) $4 - 8 + 16 - 32\dots, n = 6$

Determine the number of terms n in each geometric series.

25) $a_1 = 4, r = 2, S_n = 124$

26) $a_1 = 4, r = 2, S_n = 508$

27) $a_1 = 4, r = -3, S_n = 244$

28) $a_1 = 4, r = 3, S_n = 52$

Evaluate each geometric series described.

29) $\sum_{m=1}^8 -4 \cdot 4^{m-1}$

30) $\sum_{k=1}^9 -81 \cdot \left(-\frac{1}{3}\right)^{k-1}$

31) $\sum_{k=1}^8 (-4)^{k-1}$

32) $\sum_{i=1}^9 (-3)^{i-1}$

33) $\sum_{n=1}^9 2 \cdot 5^{n-1}$

34) $\sum_{n=1}^9 2^{n-1}$

Given two terms in a geometric sequence find the formula.

35) $a_6 = -16$ and $a_4 = -4$

36) $a_4 = 12$ and $a_6 = \frac{1}{3}$

37) $a_4 = -32$ and $a_3 = -16$

38) $a_6 = \frac{1}{32}$ and $a_3 = -\frac{1}{4}$

39) $a_3 = -8$ and $a_4 = 32$

40) $a_1 = 3$ and $a_5 = 3888$