

Determine if the sequence is geometric. If it is, find the common ratio.

- 1) -1, 6, -36, 216... 2) 4, 16, 36, 64... 3) -2, -4, -8, -16....

$$r = -6$$

NO

$$r = 2$$

Given the explicit formula for a geometric sequence, find the first 5 terms and the 8th term.

4) $a_n = 3^{n-1}$

1, 3, 9, 27, 81

$$a_8 = 2187$$

5) $a_n = (-2.5)(4)^{n-1}$

-2.5, -10, -40,

-160, -2560

$$a_8 = -40960$$

Given the recursive formula for a geometric sequence, find the first 5 terms and the explicit formula.

6) $a_1 = 2, a_n = 2a_{n-1}$

2, 4, 8, 16, 32

$$a_n = 2(2)^{n-1}$$

7) $a_1 = 4, a_n = 3a_{n-1}$

4, 12, 36, 108, 324

$$a_n = 4(3)^{n-1}$$

Given a term in a geometric sequence and the common ratio, find the explicit formula and the recursive formula.

8) $a_1 = -4, r = 6$

$$a_n = -4(6)^{n-1}$$

$$a_{k+1} = 6a_k, a_1 = -4$$

9) $a_1 = 2, r = 6$

$$a_n = 2(6)^{n-1}$$

$$a_n = 6a_{n-1}, a_1 = 2$$

10) $a_2 = 3, r = 2$

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

$$a_n = 2a_{n-1}, a_1 = \frac{3}{2}$$

11) $a_4 = 25, r = -5$

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

$$a_n = -5a_{n-1}, a_1 = -\frac{1}{5}$$

Evaluate

12)

$$\sum_{n=1}^7 4^{n-1}$$

5461

13)

$$\sum_{n=1}^{10} 4(-3)^{n-1}$$

-59,048

14) $1 - 4 + 16 - 64 \dots, n = 9$

52,429

15) $1 - 5 + 25 - 125 \dots, n = 7$

13,021

Determine the number of terms in each geometric series.

16) $a_1 = -2, r = 5, S_n = -62$

17) $-4 + 16 - 64 + 256 \dots S_n = 52,428$

$n = 3$

$n = 8$

Evaluate each infinite geometric series.

18) $a_1 = 3, r = -\frac{1}{5}$

$$\frac{5}{2}$$

19) $1 + 0.5 + 0.25 + 0.125 \dots$

$$2$$

20) $81 - 27 + 9 - 3 \dots$

$$\frac{243}{4} \text{ or } 60\frac{3}{4}$$

21)

$$\sum_{n=1}^{\infty} \left(\frac{1}{3}\right)^{n-1}$$

$$\frac{3}{2}$$

Determine the common ratio of the infinite geometric series.

22) $a_1 = 1, S = 1.25$

$$r = .2$$

23) $a_1 = -4, S = -\frac{16}{5}$

$$r = -\frac{1}{4}$$