

Geometric Sequences

Date _____ Period _____

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

1) $-1, 6, -36, 216, \dots$

2) $-1, 1, 4, 8, \dots$

3) $4, 16, 36, 64, \dots$

4) $-3, -15, -75, -375, \dots$

5) $-2, -4, -8, -16, \dots$

6) $1, -5, 25, -125, \dots$

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

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

8) $a_n = 2 \cdot \left(\frac{1}{4}\right)^{n-1}$

9) $a_n = -2.5 \cdot 4^{n-1}$

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

Given the recursive formula for a geometric sequence find the common ratio, the first five terms, and the explicit formula.

11) $a_n = a_{n-1} \cdot 2$
 $a_1 = 2$

12) $a_n = a_{n-1} \cdot -3$
 $a_1 = -3$

13) $a_n = a_{n-1} \cdot 3$
 $a_1 = 4$

14) $a_n = a_{n-1} \cdot 5$
 $a_1 = 2$

Given the first term and the common ratio of a geometric sequence find the first five terms and the explicit formula.

15) $a_1 = 0.8, r = -5$

16) $a_1 = 1, r = 2$

17) $a_1 = 1, r = \frac{1}{2}$

18) $a_1 = 2, r = -3$

Given the first term and the common ratio of a geometric sequence find the recursive formula and the three terms in the sequence after the last one given.

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

20) $a_1 = 4, r = 6$

21) $a_1 = 2, r = 6$

22) $a_1 = -4, r = 4$

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

23) $a_2 = 3, r = 2$

24) $a_5 = -\frac{16}{27}, r = \frac{2}{3}$

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

26) $a_1 = 4, r = 5$

Given two terms in a geometric sequence find the 8th term and the recursive formula.

27) $a_4 = -12$ and $a_5 = -6$

28) $a_5 = 768$ and $a_2 = 12$

29) $a_2 = -\frac{1}{3}$ and $a_1 = -1$

30) $a_5 = 3888$ and $a_3 = 108$

Answers to Geometric Sequences

- 1) $r = -6$ 2) Not geometric 3) Not geometric 4) $r = 5$
 5) $r = 2$ 6) $r = -5$ 7) First Five Terms: 1, 3, 9, 27, 81
 $a_8 = 2187$
 8) First Five Terms: $2, \frac{1}{2}, \frac{1}{8}, \frac{1}{32}, \frac{1}{128}$
 $a_8 = \frac{1}{8192}$
 9) First Five Terms: -2.5, -10, -40, -160, -640
 $a_8 = -40960$
 10) First Five Terms: -4, -12, -36, -108, -324
 $a_8 = -8748$
 11) Common Ratio: $r = 2$
 First Five Terms: 2, 4, 8, 16, 32
 Explicit: $a_n = 2 \cdot 2^{n-1}$
 12) Common Ratio: $r = -3$
 First Five Terms: -3, 9, -27, 81, -243
 Explicit: $a_n = -3 \cdot (-3)^{n-1}$
 13) Common Ratio: $r = 3$
 First Five Terms: 4, 12, 36, 108, 324
 Explicit: $a_n = 4 \cdot 3^{n-1}$
 14) Common Ratio: $r = 5$
 First Five Terms: 2, 10, 50, 250, 1250
 Explicit: $a_n = 2 \cdot 5^{n-1}$
 15) First Five Terms: 0.8, -4, 20, -100, 500
 Explicit: $a_n = 0.8 \cdot (-5)^{n-1}$
 16) First Five Terms: 1, 2, 4, 8, 16
 Explicit: $a_n = 2^{n-1}$
 17) First Five Terms: $1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}$
 Explicit: $a_n = \left(\frac{1}{2}\right)^{n-1}$
 18) First Five Terms: 2, -6, 18, -54, 162
 Explicit: $a_n = 2 \cdot (-3)^{n-1}$
 19) Next 3 terms: -24, -144, -864
 Recursive: $a_n = a_{n-1} \cdot 6$
 $a_1 = -4$
 20) Next 3 terms: 24, 144, 864 21) Next 3 terms: 12, 72, 432
 Recursive: $a_n = a_{n-1} \cdot 6$ Recursive: $a_n = a_{n-1} \cdot 6$
 $a_1 = 4$ $a_1 = 2$
 22) Next 3 terms: -16, -64, -256
 Recursive: $a_n = a_{n-1} \cdot 4$
 $a_1 = -4$
 23) First Five Terms: 1.5, 3, 6, 12, 24
 Explicit: $a_n = 1.5 \cdot 2^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot 2$
 $a_1 = 1.5$
 24) First Five Terms: -3, -2, $-\frac{4}{3}, -\frac{8}{9}, -\frac{16}{27}$
 Explicit: $a_n = -3 \cdot \left(\frac{2}{3}\right)^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot \frac{2}{3}$
 $a_1 = -3$
 25) First Five Terms: -0.2, 1, -5, 25, -125
 Explicit: $a_n = -0.2 \cdot (-5)^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot (-5)$
 $a_1 = -0.2$
 26) First Five Terms: 4, 20, 100, 500, 2500
 Explicit: $a_n = 4 \cdot 5^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot 5$
 $a_1 = 4$
 27) $a_8 = -\frac{3}{4}$
 Recursive: $a_n = a_{n-1} \cdot \frac{1}{2}$
 $a_1 = -96$

$$28) a_8 = 49152$$

$$\text{Recursive: } a_n = a_{n-1} \cdot 4$$

$$a_1 = 3$$

$$29) a_8 = -\frac{1}{2187}$$

$$\text{Recursive: } a_n = a_{n-1} \cdot \frac{1}{3}$$

$$a_1 = -1$$

$$30) a_8 = 839808$$

$$\text{Recursive: } a_n = a_{n-1} \cdot 6$$

$$a_1 = 3$$