

12.2 Geometric Sequences

Date _____ Period _____

Determine if the sequence is geometric. If it is, find the common ratio, the 8th term, the explicit formula, and the recursive formula.

1) $-6, 3, 12, 21, \dots$

2) $2, -10, 50, -250, \dots$

3) $-1, -4, -16, -64, \dots$

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

5) $3, -18, 108, -648, \dots$

6) $-2, -8, -32, -128, \dots$

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

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

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

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

9) $a_n = a_{n-1} \cdot 3$
 $a_1 = 2$

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

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

11) $a_5 = 2592, r = 6$

12) $a_1 = -3, r = 4$

13) $a_4 = -648, r = -6$

14) $a_4 = -500, r = 5$

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

15) $a_6 = 2048$ and $a_3 = -32$

16) $a_3 = 25$ and $a_4 = 125$

17) $a_2 = 5$ and $a_5 = -625$

18) $a_6 = 32$ and $a_3 = 4$

Answers to 12.2 Geometric Sequences (ID: 1)

- 1) Not geometric
- 2) Common Ratio: $r = -5$
 $a_8 = -156250$
 Explicit: $a_n = 2 \cdot (-5)^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot -5$
 $a_1 = 2$
- 3) Common Ratio: $r = 4$
 $a_8 = -16384$
 Explicit: $a_n = -4^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot 4$
 $a_1 = -1$
- 4) Common Ratio: $r = 2$
 $a_8 = 256$
 Explicit: $a_n = 2 \cdot 2^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot 2$
 $a_1 = 2$
- 5) Common Ratio: $r = -6$
 $a_8 = -839808$
 Explicit: $a_n = 3 \cdot (-6)^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot -6$
 $a_1 = 3$
- 6) Common Ratio: $r = 4$
 $a_8 = -32768$
 Explicit: $a_n = -2 \cdot 4^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot 4$
 $a_1 = -2$
- 7) Common Ratio: $r = -4$
 First Five Terms: 1, -4, 16, -64, 256
 Recursive: $a_n = a_{n-1} \cdot -4$
 $a_1 = 1$
- 8) Common Ratio: $r = 5$
 First Five Terms: -3, -15, -75, -375, -1875
 Recursive: $a_n = a_{n-1} \cdot 5$
 $a_1 = -3$
- 9) Common Ratio: $r = 3$
 First Five Terms: 2, 6, 18, 54, 162
 Explicit: $a_n = 2 \cdot 3^{n-1}$
- 10) Common Ratio: $r = -4$
 First Five Terms: -4, 16, -64, 256, -1024
 Explicit: $a_n = -4 \cdot (-4)^{n-1}$
- 11) Explicit: $a_n = 2 \cdot 6^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot 6$
 $a_1 = 2$
- 12) Explicit: $a_n = -3 \cdot 4^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot 4$
 $a_1 = -3$
- 13) Explicit: $a_n = 3 \cdot (-6)^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot -6$
 $a_1 = 3$
- 14) Explicit: $a_n = -4 \cdot 5^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot 5$
 $a_1 = -4$
- 15) Common Ratio: $r = -4$
 Explicit: $a_n = -2 \cdot (-4)^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot -4$
 $a_1 = -2$
- 16) Common Ratio: $r = 5$
 Explicit: $a_n = 5^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot 5$
 $a_1 = 1$
- 17) Common Ratio: $r = -5$
 Explicit: $a_n = -(-5)^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot -5$
 $a_1 = -1$
- 18) Common Ratio: $r = 2$
 Explicit: $a_n = 2^{n-1}$
 Recursive: $a_n = a_{n-1} \cdot 2$
 $a_1 = 1$