

Name: Key

Unit 6: Exponents & Exponential Functions

Date: _____ Bell: _____

Homework 9: Geometric Sequences



Determine whether each sequence is a geometric sequence. If yes, identify the common ratio.

1. 4, 12, 36, 108, ... $r = 3$ yes

2. 5, 10, 15, 20, ... NO

3. 120, -60, 30, -15, ... yes $r = -\frac{1}{2}$

4. 1, -4, 16, -64, ... yes $r = -4$

5. 50, 35, 20, ... NO

6. 625, 125, 25, 5, ... yes $r = 0.2 / \frac{1}{5}$

Find the next three terms of each geometric sequence.

7. 4, 8, 16, 32, 64, 128

8. 1, -6, 36, -216, 1296, -7776

9. 486, 162, 54, 18, 6, 2

10. 3, 15, 75, 375, 1875, 9375

11. 240, -120, 60, -30, 15, -7.5

12. -5, -20, -80, -320, -1280, -5120

Write an equation to find the nth term of each sequence. Then find a_9 .

13. 5, 20, 80, ... $r = \frac{20}{5} = 4$

$a_1 = 5$
 $a_n = (4)a_{n-1}$

$a_n = 5(4)^{n-1}$
 $a_9 = 5(4)^8 = 327680$

14. -2, 10, -50, ... $r = \frac{10}{-2} = -5$

$a_1 = -2$
 $a_n = (-5)a_{n-1}$

$a_n = -2(-5)^{n-1}$
 $a_9 = -2(-5)^8 = -781250$

15. -65536, 16384, -4096, ... $r = -\frac{1}{4}$

$a_1 = -65536$
 $a_n = (-\frac{1}{4})a_{n-1}$

$a_n = -65536(-\frac{1}{4})^{n-1}$
 $a_9 = -65536(-\frac{1}{4})^8 = -1$

16. 6, -18, 54, ... $r = -3$

$a_1 = 6$
 $a_n = (-3)a_{n-1}$

$a_n = 6(-3)^{n-1}$
 $a_9 = 6(-3)^8 = 39366$

17. 1536, 768, 384, ... $r = \frac{1}{2}$

$a_1 = 1536$
 $a_n = (\frac{1}{2})a_{n-1}$

$a_n = 1536(\frac{1}{2})^{n-1}$
 $a_9 = 1536(\frac{1}{2})^8 = 6$

18. -1, -7, -49, ... $r = 7$

$a_1 = -1$
 $a_n = (7)a_{n-1}$

$a_n = -1(7)^{n-1}$
 $a_9 = -1(7)^8 = -5764801$

A ball is dropped from a height of 500 meters. The table shows the height of each bounce.

Bounce	Height (m)
1	400
2	320
3	256

19. Write a rule to represent the height of the ball after each bounce.

$a_n = 400(\frac{4}{5})^{n-1}$

20. How high does the ball bounce on the 6th bounce?

$a_6 = 400(\frac{4}{5})^{6-1} = 131072$