

12.1- Geometric Sequences-- Day 1

Date _____

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

1) $-2, -8, -32, -128, \dots$ $R=4$
 $\begin{matrix} \curvearrowright & \curvearrowright \\ \times 4 & \times 4 \end{matrix}$

EF $\Rightarrow a_n = -2 \cdot 4^{n-1}$

$a_8 = -2 \cdot 4^7$

$a_8 = -32,768$

3) $-1, -5, -25, -125, \dots$ $R=5$

EF $\Rightarrow a_n = -1 \cdot 5^{n-1}$

$a_8 = -1 \cdot 5^7$

$a_8 = -78,125$

2) $-2, -12, -72, -432, \dots$ $R=6$

EF $\Rightarrow a_n = -2 \cdot 6^{n-1}$

$a_8 = -2 \cdot 6^7$

$a_8 = -559,872$

4) $-2, -10, -50, -250, \dots$ $R=5$
 $\begin{matrix} \curvearrowright \\ \times 5 \end{matrix}$

EF $\Rightarrow a_n = -2 \cdot 5^{n-1}$

$a_8 = -2 \cdot 5^7$

$a_8 = -156,250$

Given the first term and the common ratio of a geometric sequence find the 8th term and the explicit formula.

5) $a_1 = -4, r = 5$

EF $\Rightarrow -4 \cdot 5^{n-1}$

$a_8 = -4 \cdot 5^7$

$a_8 = -312,500$

7) $a_1 = -4, r = -2$

EF $\Rightarrow -4 \cdot (-2)^{n-1}$

$a_8 = -4 \cdot (-2)^7$

$a_8 = 512$

Find the common ratio, the 8th term, and the explicit formula.

9) $-3, -9, -27, -81, \dots$ $R=3$

EF $\Rightarrow a_n = -3 \cdot 3^{n-1}$

$a_8 = -3 \cdot 3^7$

$a_8 = -6,561$

11) $-2, -6, -18, -54, \dots$ $R=3$

EF $\Rightarrow a_n = -2 \cdot 3^{n-1}$

$a_8 = -2 \cdot 3^7$

$a_8 = -4,374$

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

EF $\Rightarrow -2 \cdot 3^{n-1}$

$a_8 = -2 \cdot 3^7$

$a_8 = -4,374$

8) $a_1 = 4, r = 3$

EF $\Rightarrow 4 \cdot 3^{n-1}$

$a_8 = 4 \cdot 3^7$

$a_8 = 8,748$

10) $2, 4, 8, 16, \dots$ $R=2$

EF $\Rightarrow a_n = 2 \cdot 2^{n-1}$

$a_8 = 2 \cdot 2^7$

$a_8 = 256$

12) $4, 16, 64, 256, \dots$ $R=4$

EF $\Rightarrow a_n = 4 \cdot 4^{n-1}$

$a_8 = 4 \cdot 4^7$

$a_8 = 65,536$

LESSON
12-1

Problem Solving
Geometric Sequences

Write the correct answer.

1. A ball is dropped from 400 feet. The table shows the height of each bounce.

Bounce	Height (ft)
1	280
2	196
3	137.2

$n-1 \rightarrow 6-1$
 $280 \cdot .75^5$

Find the height of the ball on the 6th bounce. Round your answer to the nearest tenth of a foot.

47.1 ft

3. Jeanette started selling bagels to offices in her area. Her sales for the first 3 months are shown in the table.

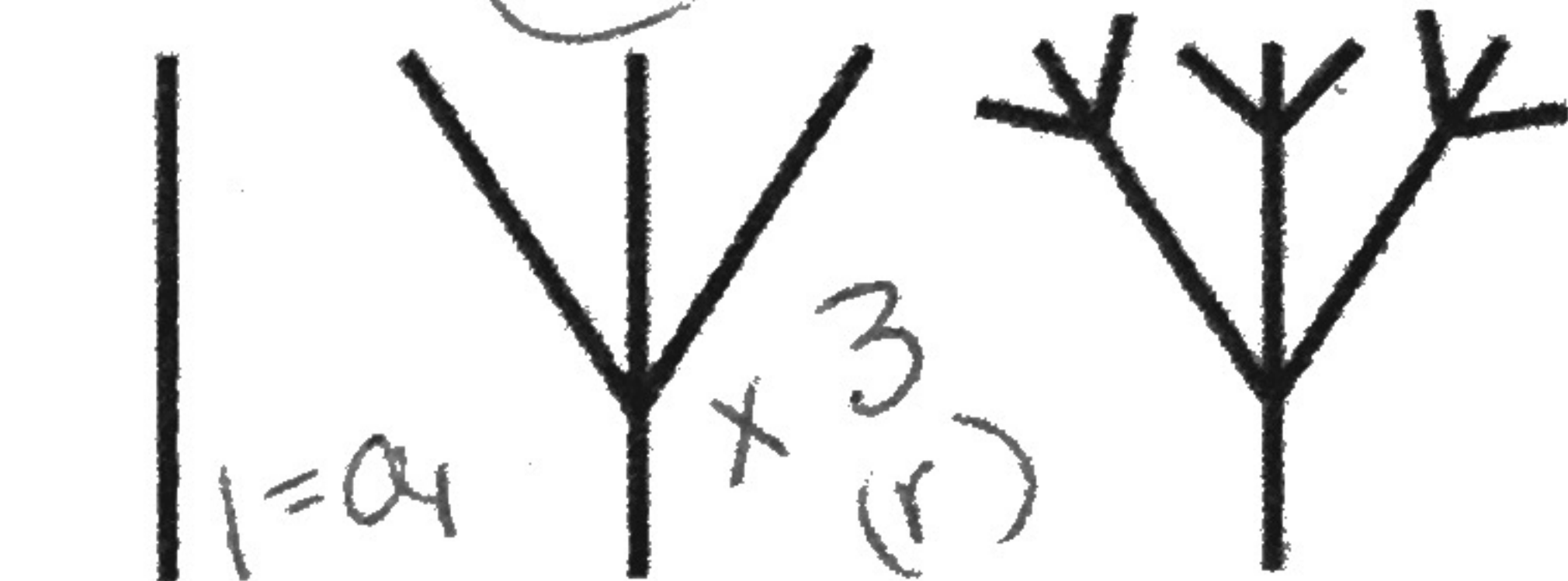
Month	Sales (\$)
1	\$200.00
2	\$230.00
3	\$264.50

$200 \cdot 1.15^7$

If this trend continues, find the amount of Jeanette's sales in Month 8.

\$ 532

2. A plant starts with 1 branch. Every year, each branch becomes 3 branches. A sketch of the plant for the first 3 years is shown. How many branches will the plant have in year 10?



Year 1 Year 2 Year 3

$1 \cdot 3^9 = 19683$

How many branches would the plant have in year 10 if the plant had 5 branches the first year? (Each branch still becomes 3 branches every year.)

$5 \cdot 3^9 = 98415$

The table shows the number of houses in a new subdivision. Use the table to answer questions 4–7. Select the best answer.

Month	Houses
1	3
2	6
3	12
4	24

$\times 2$ Tripled
3
9
27
81

4. The number of houses forms a geometric sequence. What is r ?
A 0.5 C 3
B 2 D 6
5. Assuming that the trend continues, how many houses would be in the subdivision in Month 6?
F 36 H 60
G 48 **J 96**
6. Management decides the subdivision is complete when the number of houses reaches 48. When will this happen?
A Month 5 C Month 7
B Month 6 D Month 8
7. Suppose the number of houses tripled every month. How many more houses would be in the subdivision in Month 4? (The number of houses in Month 1 is still 3.)
F 48 H 72
G 57 **J 81**