

1.) Solve the equation: $x + 7 = 12$

$$\frac{x}{4} - 7 = -7$$

$$\frac{x}{4} = 5 \quad \boxed{x=20}$$

2.) Find the slope: $(1.5, 4.5)$ $(4, 3.9)$ $m = \frac{3.9 - 4.5}{4 - 1.5}$

$$\boxed{m = -0.24}$$

$$\frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-0.6}{2.5}$$

3.) Solve for y: $5x - 3y = 3$

$$\begin{array}{r|l} -5x & -5x \\ \hline -3y = & -5x + 3 \\ -3 & -3 \end{array}$$

$$y = \frac{5}{3}x - 1$$

4.) Write the equation of the line passing through
 $(-5, -7)$ and $(-2, 4)$.

$$m = \frac{4 - (-7)}{-2 - (-5)} = \frac{11}{3}$$

$$\begin{array}{c} (-2, 4) \\ \downarrow \quad \downarrow \\ x \quad y \end{array}$$

$$y = mx + b$$

$$4 = \frac{11}{3}(-2) + b$$

$$\left(\frac{+22}{3}\right) = \frac{+22}{3} + b$$

$$\frac{34}{3} = b$$

$$y = \frac{11}{3}x + \frac{34}{3}$$

$$3(n-9) = 8n+18$$


$$3n-27 = 8n+18$$

$$\begin{array}{r} -3n \quad -3n \\ \hline \end{array}$$

$$-27 = 5n+18$$

$$\begin{array}{r} +27 \quad +27 \\ \hline \end{array}$$

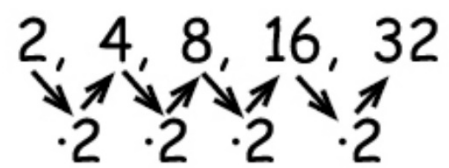
$$5n = 45$$


$$0 = 5n+45$$

$$-45 = 5n$$

$$n = -9$$

Geometric Sequences



What is it?

Geometric Sequences	sequence of numbers that follows a pattern where the next term is found by multiplying by a constant called the common ratio, r .
Common Ratio	the number used to repeatedly multiply.

↓
multiplication
or division

$2, 4, 8, 16$ --> *Repeated Multiplication, $r = 2$*

$27, 9, 3, 1, \dots$ --> *Repeated Multiplication, $r = 1/3$*

Determine whether the sequence is geometric. If yes, identify the common ratio and give the next three terms.

<p>1. $\{6, 12, 24, 48, \dots\}$ <input checked="" type="radio"/> Yes or No $r = 2$ 96, 192, 384</p>	<p>2. $\{810, 270, 90, 30, \dots\}$ <input checked="" type="radio"/> Yes or No $r = \frac{1}{3}$ 10, $\frac{10}{3}$, $\frac{10}{9}$</p>
<p>3. $\{-2, 10, -50, 250, \dots\}$ <input checked="" type="radio"/> Yes or No -1250, 6250, $r = -5$ -31250</p>	<p>4. $\{4, 8, 20, 60, \dots\}$ Yes or <input checked="" type="radio"/> No $r =$ _____</p>
<p>5. $\{4, -1, \frac{1}{4}, -\frac{1}{16}, \dots\}$ <input checked="" type="radio"/> Yes or No $\frac{1}{4}, -\frac{1}{256}, \frac{1}{1024}$ $r = -\frac{1}{4}$</p>	<p>6. $\{2, 4, 16, 256, \dots\}$ Yes or <input checked="" type="radio"/> No $r =$ _____</p>
<p>7. $\{-2, -14, -98, -686, \dots\}$ <input checked="" type="radio"/> Yes or No -4802, -33014, $r = 7$ -235298</p>	<p>8. $\{3.2, 8, 20, 50, \dots\}$ <input checked="" type="radio"/> Yes or No 125, 312.5, $r = 2.5$ 781.25</p>

One Step Further - For the geometric sequences above, find the next three terms in the sequence.

Formulas and their Purpose

Geometric Sequences

Explicit Formula: $A_n = a_1 \cdot r^{n-1}$

“Finds a specific term”

Current
Term

First Term

Common Ratio

Previous
Term

Recursive Formula: $A_n = A_{n-1} \cdot r$

“Uses previous terms to find the next terms”

5



Write a rule for each sequence, then find a_6 .

9. $\{1, 5, 25, 125, \dots\}$

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

$$a_6 = 1 \cdot 5^{6-1}$$

$$a_6 = 1 \cdot 5^5$$

$$r = \underline{5}$$

$$a_1 = \underline{1}$$

$$n = \underline{6}$$

$$a_6 = 3125$$

10. $\{130, 65, 32.5, 16.25, \dots\}$

$$a_n = 130 \cdot \frac{1}{2}^{n-1}$$

$$a_6 = 130 \cdot \frac{1}{2}^{6-1}$$

$$a_6 = 130 \cdot \frac{1}{2}^5$$

$$r = \underline{\frac{1}{2}}$$

$$a_1 = \underline{130}$$

$$n = \underline{6}$$

$$a_6 = \frac{65}{16}$$

11. $\{2, -8, 32, -128, \dots\}$

$r = \underline{-4}$

$a_1 = \underline{2}$

$n = \underline{6}$

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

$a_6 = 2 \cdot -4^{6-1}$

$a_6 = 2 \cdot -4^5$

$a_6 = -2048$

You Try:

13. $\{135, 90, 60, 40, \dots\}$

$r = \underline{\hspace{2cm}}$

$a_1 = \underline{\hspace{2cm}}$

$n = \underline{\hspace{2cm}}$

12. $\{8, 24, 72, 216, \dots\}$

$r = \underline{3}$

$a_1 = \underline{8}$

$n = \underline{6}$

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

$a_6 = 8 \cdot 3^{6-1}$

$a_6 = 8 \cdot 3^5$

$a_6 = 1944$

14. $\{-3200, 800, -200, 50, \dots\}$

$r = \underline{\hspace{2cm}}$

$a_1 = \underline{\hspace{2cm}}$

$n = \underline{\hspace{2cm}}$

$a_n = \underline{\hspace{2cm}}$

Use the information given to find the indicated value.

15. $a_1 = 7$ and $r = 4$; Find a_8

$$a_n = 7 \cdot 4^{n-1}$$

$$a_8 = 7 \cdot 4^{8-1}$$

$$a_8 = 7 \cdot 4^7$$

$$a_8 = 114,688$$

16. $a_5 = -68$ and $r = -0.5$; Find a_1

$$r = \frac{-1}{2}$$

$$-1088, 544, -272, 136, -68$$

Application

Jackson bought a brand new car for \$38,000. If the car depreciates in value by 20% each year, what will the car be worth in 8 years?