

Geometric Sequences and Series

<p>1. Given: 3, -6, 12, -24, ... Find <math>a_9</math></p> <p><math>a_9 = 3(-2)^{9-1}</math> <math>a_9 = 768</math></p>	<p>2. Given 2700, 900, 300, 100, ... Find <math>a_8</math></p> <p><math>a_8 = 2700(\frac{1}{3})^{8-1}</math> <math>a_8 = \frac{100}{81}</math></p>
<p>3. Given: <math>a_n = 5(2)^{n-1}</math> Find 1<sup>st</sup> 5 terms of Geometric Sequence</p> <p>5, 10, 20, 40, 80</p>	<p>4. Evaluate the geometric series described</p> <p><math>\sum_{k=1}^8 3(4)^{k-1}</math> <math>S_8 = \frac{3(1-4^8)}{1-4}</math> <math>S_8 = 65,535</math></p>
<p>5. Determine the number of terms n in the geometric series <math>A_1 = 4, r = 3, S_n = 4372</math></p> <p><math>4372 = \frac{4(1-3^n)}{1-3}</math> <math>-2187 = -3^n</math> <math>4372 = \frac{4(1-3^n)}{-2}</math> <math>2187 = 3^n</math> <math>-8744 = 4(1-3^n)</math> <math>1093 \cdot 2187 = 1</math> <math>-2186 = 1-3^n</math> <math>\boxed{n=7}</math></p>	<p>6. Given 2 terms in the geometric sequence, find the formula <b>HINT: find r &amp; <math>a_1</math> and plug into formula for <math>a_n</math></b> <math>A_{11} = 2025</math> and <math>a_7 = 400</math></p> <p><math>a_{11} = a_7 \cdot r^4</math> <math>a_7 = a_1 \cdot r^6</math> <math>2025 = 400r^4</math> <math>400 = a_1(\frac{3}{2})^6</math> <math>\frac{81}{16} = r^4</math> <math>400 = a_1(\frac{729}{64})</math> <math>\frac{3}{2} = r</math> <math>\frac{25600}{729} = a_1</math> <math>a_n = \frac{25600}{729}(\frac{3}{2})^{n-1}</math></p>

Graph the following piecewise functions

7.

$$f(x) = \begin{cases} -x & x \leq -2 \\ 3x & -2 < x \leq 2 \\ -2 & x > 2 \end{cases}$$

INC:  
 $(-2, 2]$

DEC:  
 $(-\infty, -2]$

Constant:  
 $[2, \infty)$

Point of Discontinuity:  
 $x=2$   $x=-2$

What is  $f(-1)$ ?  
 $f(-1) = -3$

8.

$$g(x) = \begin{cases} x^2 - 1, & x < -1 \\ 3 - x, & x \geq -1 \end{cases}$$

Domain:  $\mathbb{R}$

Range:  $\mathbb{R}$

Point of Discontinuity:  
 $x = -1$

What is  $g(3)$ ?  
 $g(3) = 0$

Name: \_\_\_\_\_

EXTRA Test Review

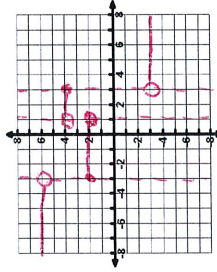
$$9. f(x) = \begin{cases} 6 & x < -3 \\ 2 & -3 \leq x \leq 1 \\ 4 & 1 < x \leq 3 \\ -3 & x > 3 \end{cases}$$

Range:

$\{-3, 2, 4, 6\}$   
 $[-3] \cup [2, 4] \cup [6]$

Points of Discontinuity:

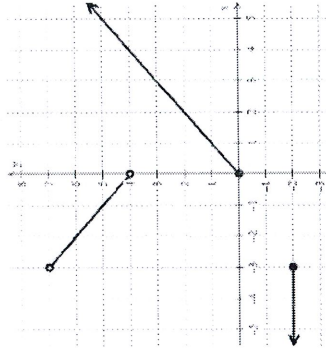
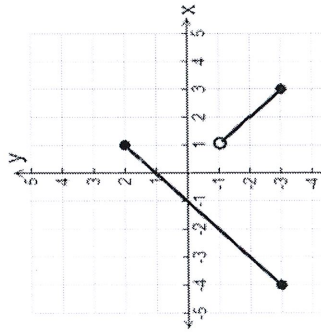
$x = -3$   
 $x = 1$   
 $x = 3$



Write the equation of the piecewise function

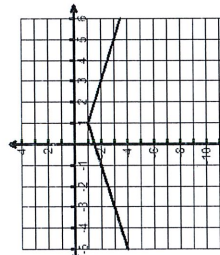
$$10. f(x) = \begin{cases} x+1 & -4 \leq x \leq 1 \\ -x & 1 < x \leq 3 \end{cases}$$

$$11. f(x) = \begin{cases} -2 & x < -3 \\ -x+4 & -3 \leq x < 0 \\ x & 0 \leq x \end{cases}$$



Write as an absolute value given the graph

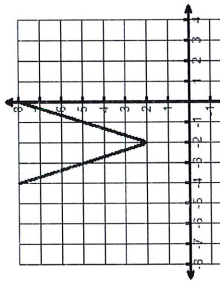
12.



V:  $(-1, -1)$   
 $a = -\frac{1}{2}$

$f(x) = -\frac{1}{2}|x - (-1)| - 1$

13.



V:  $(2, 2)$   
 $a = \frac{3}{4}$

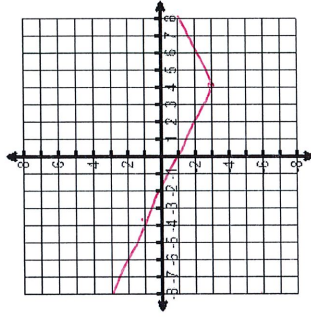
$g(x) = \frac{3}{4}|x - 2| + 2$

EXTRA Test Review

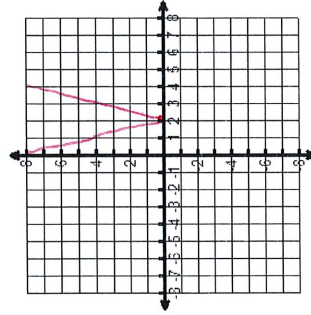
Name: \_\_\_\_\_

Graph each absolute value function

14.  $g(x) = \frac{1}{2}|x - 4| - 3$



15.  $h(x) = 4|x - 2|$



Solve each absolute value equation

16.  $2|x - 1| + 4 = -12$

$2|x - 1| = -16$   
 $|x - 1| = -8$   
 $x - 1 = -8$   
 $x = -7$   
 $x - 1 = 8$   
 $x = 9$   
**No Solution**

17.  $-|x + 3| + 12 = 7$

$-|x + 3| = -5$   
 $|x + 3| = 5$   
 $x + 3 = 5$   
 $x = 2$   
 $x + 3 = -5$   
 $x = -8$   
**X = 2, -8**

18.  $-|x - 4| = 2x + 7$

$|x - 4| = -2x - 7$   
 $x - 4 = -2x - 7$   
 $3x = -3$   
 $x = -1$   
 $x - 4 = 2x + 7$   
 $-x = 11$   
 $x = -11$   
**X = -1, -11**

Solve each equation for the given variable

19.  $4t + gt = 2z$  Solve for h

$-4t$   
 $gt = -4t + 2z$   
 $t = \frac{-4t + 2z}{g}$   
 $h = \frac{-4t + 2z}{g}$

20.  $\frac{2a - 3b}{7} = D$  Solve for a

$\cdot 7$   
 $2a - 3b = 7D$   
 $+3b$   
 $2a = 3b + 7D$   
 $a = \frac{3b + 7D}{2}$

21.  $B = \frac{3}{4}(N + 5)$  Solve for N

$\cdot 4$   
 $4B = 3(N + 5)$   
 $\frac{4B}{3} = N + 5$   
 $\frac{4B}{3} - 5 = N$