Mathematical Modeling

EXTRA Test Review

Name:_____

First Determine if the Sequence is Geometric. Then answer the question it is requesting

1. Given: 3, -6, 12, -24, ... $a_1 = 3$ $r = -2$
   Find a_9 $a_9 = 3(-2)^8$
   $a_9 = 768$

2. Given 2700, 900 , 300, 100, ...
   Find a_8 $a_1 = 2700$ $r = \frac{1}{3}$
   $a_8 = 2700\left(\frac{1}{3}\right)^7$
   $a_8 = 1.235$ or $\frac{100}{81}$

3. Given: $a_n = 5(2)^{n-1}$
   Find 1st 5 terms of Geometric Sequence
   5, 10, 20, 40, 80

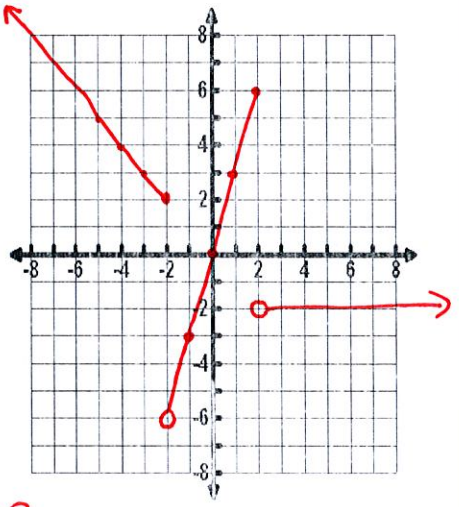
4. Evaluate the geometric sequence described
   $\sum_{k=1}^{8} 3(4)^{k-1}$
   65, 535

5. Determine the number of terms n in the geometric sequence
   $A_1 = 4$, $r = 3$, $S_n = 4372$
   $4372 = \frac{4(1-3^n)}{1-3=-2}$
   $4372 = -2(1-3^n)$
   $-2186 = 1-3^n$
   $-2187 = -3^n$
   $3^7 = 3^n$
   $n = 7$

6. Given 2 terms in the geometric sequence, find the formula
   HINT: find r & a_1 and plug into formula for a_n
   $A_{11} = 2025$ and $a_7 = 400$
   $a_{11} = a_7 r^4$
   $2025 = 400 r^4$
   $5.0625 = r^4$
   $1.5 = r$
   $400 = a_1 r^6$
   $400 = 11.390625 a_1$
   $35.117 = a_1$
   $a_n = 35.117(1.5)^{n-1}$

Graph the following piecewise functions

7.
$$f(x) = \begin{cases} -x & x \le -2 \\ 3x & -2 < x \le 2 \\ -2 & x > 2 \end{cases}$$



INC: $(-2, 2)$

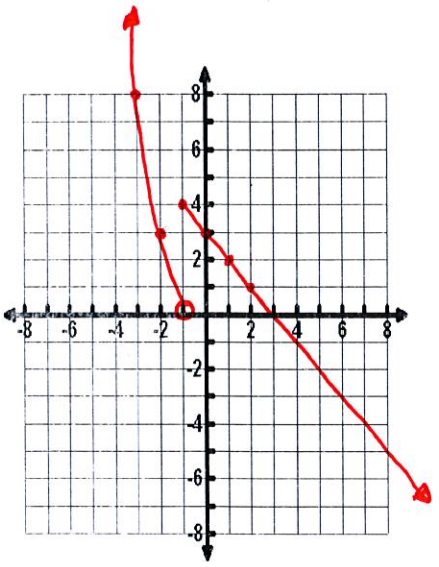
DEC: $(-\infty, -2)$

Constant: $(2, \infty)$

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

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

8.
$$g(x) = \begin{cases} x^2 - 1, & x < -1 \\ 3 - x, & x \ge -1 \end{cases}$$



Domain: $(-\infty, \infty)$ or $\mathbb{R}$

Range: $(-\infty, \infty)$ or $\mathbb{R}$

Point of Discontinuity: $x = -1$

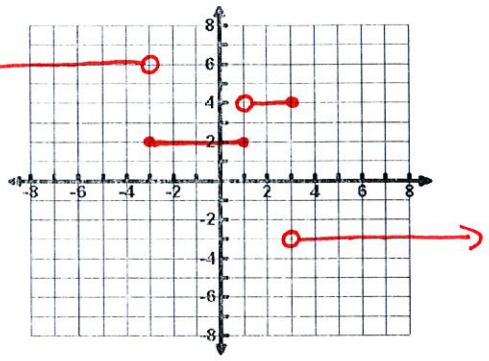
What is g(3)? $= 0$

Name:_____

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

Range:

$[-3]\cup[2]\cup[4]\cup[6]$



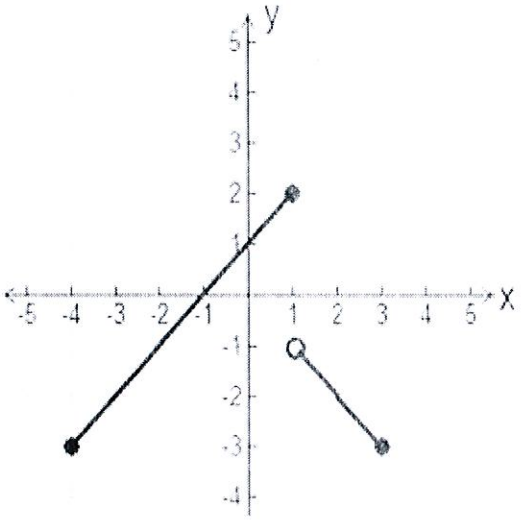
Points of Discontinuity:

$x=-3,\ x=1,\ x=3$

Write the equation of the piecewise function

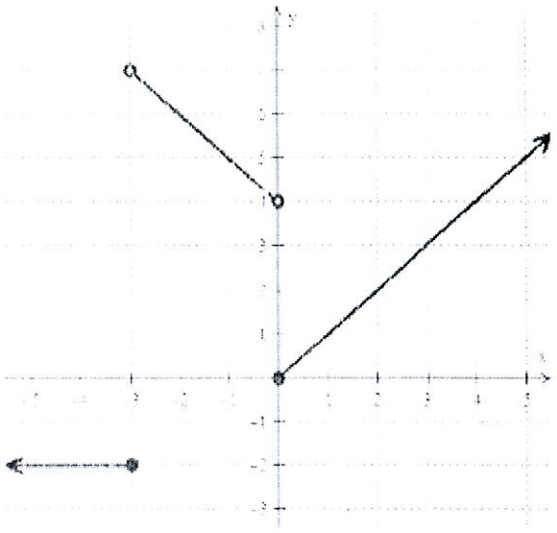
10.

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



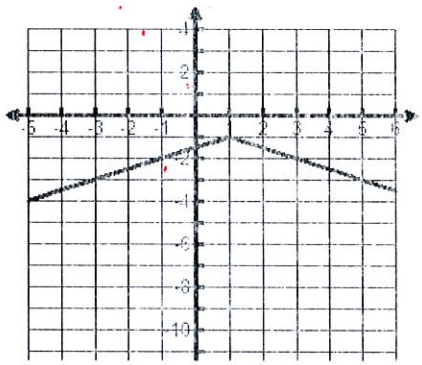
11.

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



Write as an absolute value given the graph

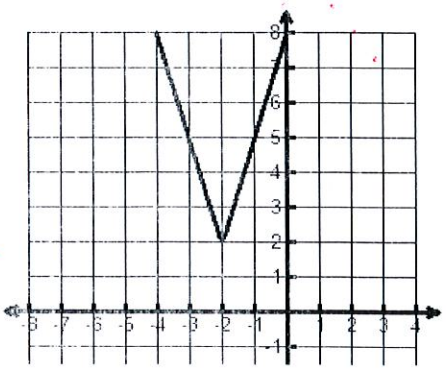
12.



1, −1

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

13.



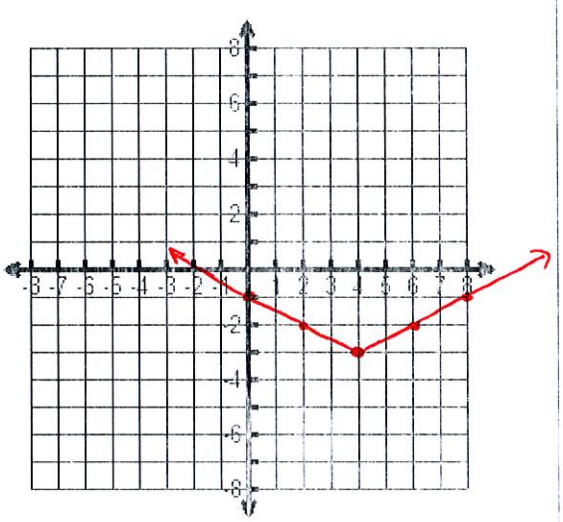
−2, 2

G(x)= $3|x+2|+2$

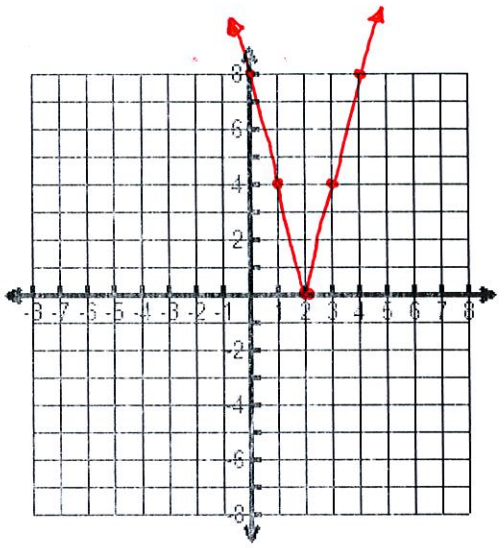
Name:_____

Graph each absolute value function

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



15. $h(x)=4|x-2|$ (2, 0)



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

$-|x+3|=-5$

$|x+3|=5$

$x+3=5$ $x=2$ $x+3=-5$ $x=-8$

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

$|x-4|=-2x-7$

$x-4=-2x-7$ $3x=-3$ ~~$x=-1$~~ $x-4=2x+7$ $-11=x$

Solve each equation for the given variable

19. $4v+gh=2z$ Solve for h

$gh=2z-4v$

$h=\frac{2z-4v}{g}$

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

$2a-3b=7D$

$2a=7D+3b$

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

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

$\frac{4B}{3}=N+5$

$\frac{4B}{3}-5=N$