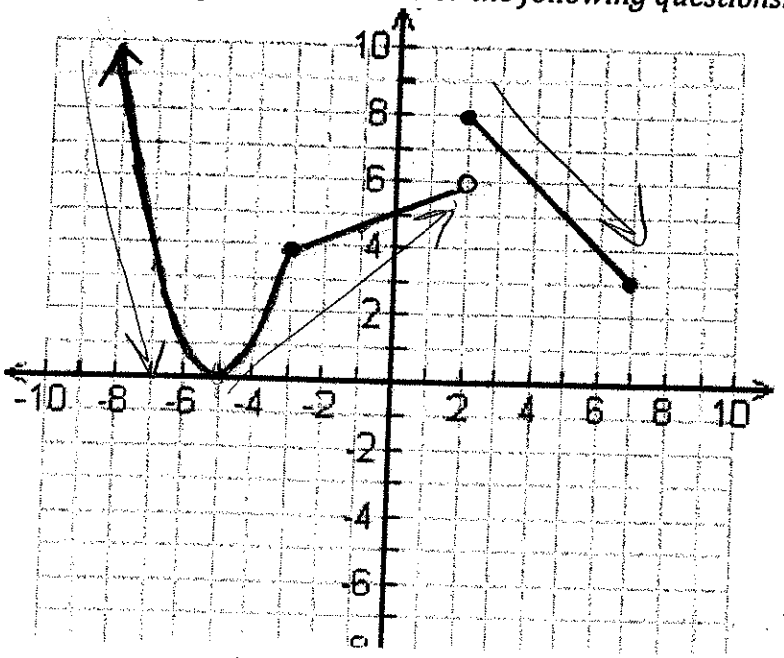
(Review)

AGS 2 Module 4 Name: Key Per: _____

LT 1: Communication LT 2: Patterns/Modeling LT 4: Solving	LT 1	LT 2	LT 4

1. *Use the graph below to answer the following questions.*



a. Maximum None

b. Minimum (-5, 0)

X-values

c. Interval(s) where Increasing [-5, 2)

d. Interval(s) where Decreasing $(-\infty, -5] \cup [2, 7]$

e. Domain $(-\infty, 7]$

Y-values → f. Range $[0, \infty)$

g. x-intercept (s): (-5, 0)

h. y-intercept (s): (0, 5)

i. f(-1) + f(2) = 4.5 + 8 = 12.5

j. When f(x) = 4, Find x= -7, -3, 6

k. Continuous or Discontinuous? Why?

Need to pick up pencil

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2. Graph each function on the same graph below:

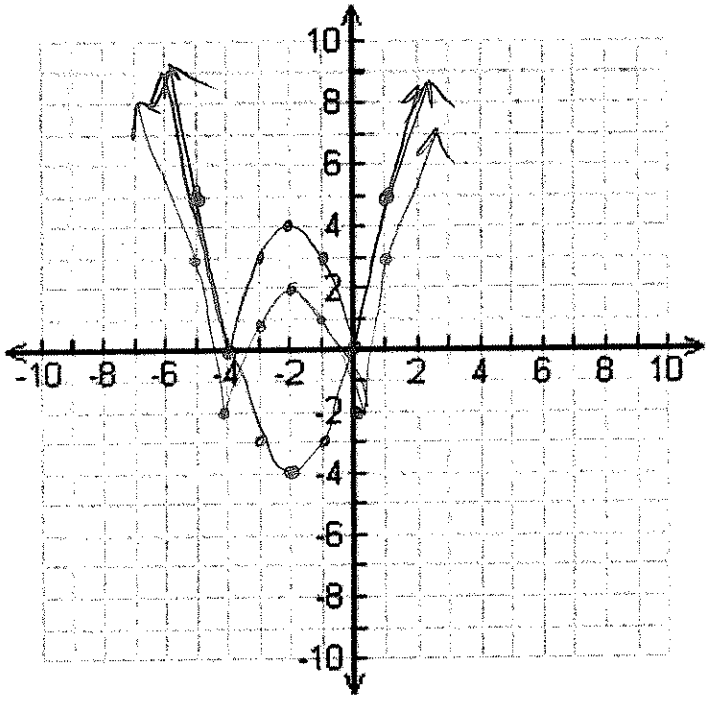
a. $f(x) = (x+2)^2 - 4$ ↓ (-2, -4)

b. $g(x) = |(x+2)^2 - 4|$

c. $h(x) = |(x+2)^2 - 4| - 2$ ↓

d. Write the piecewise function for h(x)

$$f(x) = \begin{cases} ((x+2)^2-4) - 2 & x \leq -4 \text{ and } x \geq 0 \\ -((x+2)^2-4) - 2 & -4 < x < 0 \end{cases}$$



X	Y
-5	5
-4	0
-3	-3
-2	-4
-1	-3
0	0
1	5

X	Y
-5	5
-4	0
-3	+3
-2	+4
-1	+3
0	0
1	5

3. Using the function $f(x) = |x - 3| + 5$ for the following problems:

a. f (4) = 6 $f(4) = |4-3| + 5$ → $f(4) = 1 + 5$
$f(4) = |1| + 5$ → $f(4) = 6$

b. f (-5) = 13 $f(-5) = |-5-3| + 5$ → $f(-5) = 8 + 5$
$f(-5) = |-8| + 5$ → $f(-5) = 13$

c. f(x) = 1, x = _____ and x = _____ Not possible

$1 = |x-3| + 5$

$-4 = |x-3|$ ← Absolute value cannot be equal to something negative

d. f(x) = 7, x = 5 and x = 1

$7 = |x-3| + 5$

$2 = |x-3|$ → $2 = x-3$ $\quad -2 = x-3$

$5 = x$ $\quad 1 = x$

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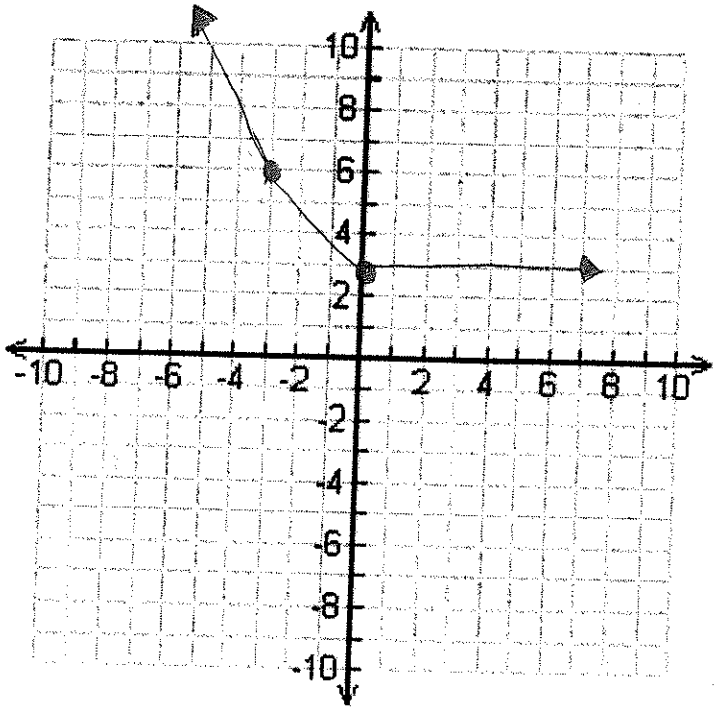
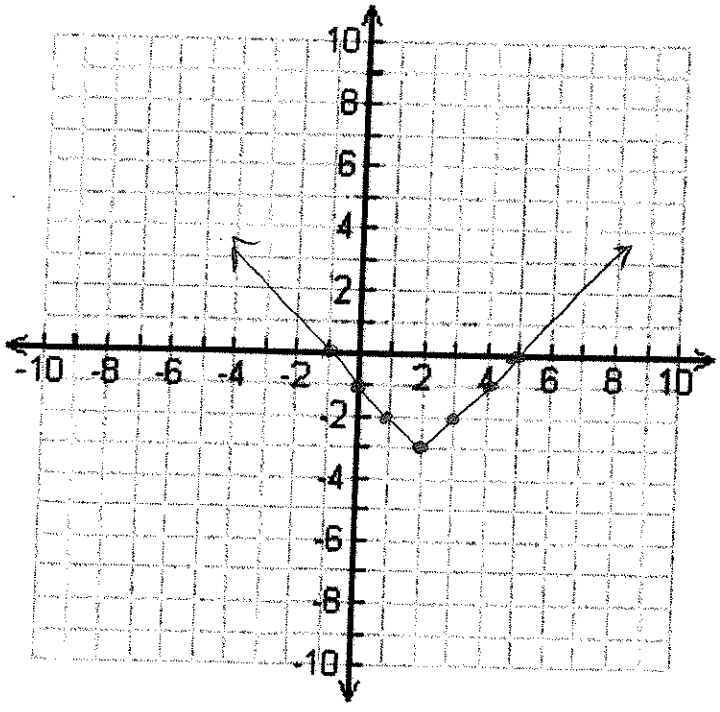
3. Graph the piecewise function:

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



4. Graph the following function and give the piecewise function

$f(x) = |x - 2| - 3$



Piecewise Function:

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

a. f(2) = -3

b. f(6) = 1

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5. Show the inverses to the following function through equations, tables, and graphs. Please label your graphs showing which is the original function and which is the inverse:

a. f(x) = 2x-2 Inverse: $f^{-1}(x) = \frac{x+2}{2}$ or $\frac{1}{2}x+1$

x	f(x)
-3	-8
-2	-6
-1	-4
0	-2
1	0
2	2
3	4

x	$f^{-1}(x)$
-8	-3
-6	-2
-4	-1
-2	0
0	1
2	2
4	3

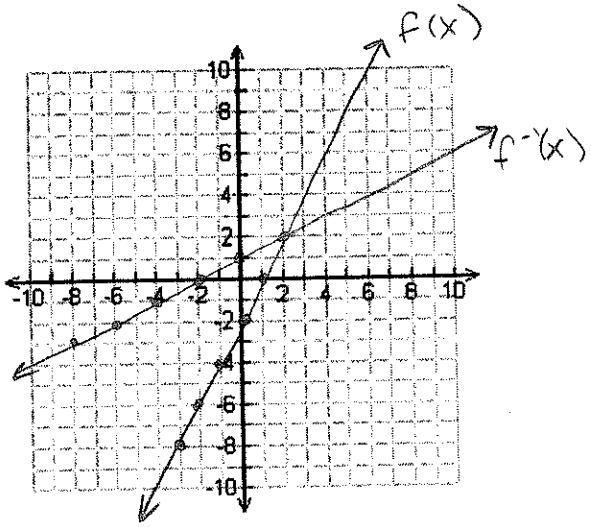
$y = 2x-2$

$x = 2y-2$

$x+2 = 2y$

$y = \frac{x+2}{2}$

$y = \frac{1}{2}x+1$



6. Solve each function to find its inverse.

a. $g(x) = x^2+4$ $x = y^2+4$ Inverse: $g^{-1}(x) = \sqrt{x-4}$

$\sqrt{x-4} = \sqrt{y^2}$

$\sqrt{x-4} = y$

b. h(x) =- 3x-6 $x = -3y-6$ Inverse: $h^{-1}(x) = \frac{x+6}{-3}$ or $-\frac{1}{3}x-2$

$\frac{x+6}{-3} = \frac{-3y}{-3}$

c. $j(x) = \frac{1}{2}x+8$ $x = \frac{1}{2}y+8$ Inverse: $j^{-1}(x) = 2x-16$

$2 \cdot (x-8) = (\frac{1}{2}y) \cdot 2$

$2x-16 = y$

d. p(x) = (1, 2), (3, -1), (9, 7), (-6, 5), (4, ½)
Inverse: $p^{-1}(x)$ = (2, 1) (-1, 3) (7, 9) (5, -6) (½, 4)