Questions on 4.2 HW?

Apr 8-8:30 AM

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Solve for x. (You will have two answers.)

P ||
E
M or D
A or S

1. $|x| = 7$ ± 7

2. $|x - 6| = 3$

3. $|w + 4| = 11$

$|-11| = 11$
$|11| = 11$

$w + 4 = 11$, $-4\ \ -4$, $w = 7$
$w + 4 = -11$, $-4\ \ -4$, $w = -15$

4. $-9|m| = -63$

5. $|3d| = 15$

6. $|3x - 5| = 11$

7. $-|m + 3| = -13$

8. $|-4m| = 64$

9. $2|x + 1| - 7 = -3$

$+7\ \ +7$
$\frac{2|x+1|}{2} = \frac{4}{2}$
$|x+1| = 2$
$x + 1 = 2$, $-1\ \ -1$, $x = 1$
$x + 1 = -2$, $-1\ \ -1$, $x = -3$

10. $5|c + 3| - 1 = 9$

11. $-2|2p - 3| - 1 = -11$

12. Explain why the equation $|m| = -3$ has no solution.

Set

Topic: Reading the domain and range from a graph

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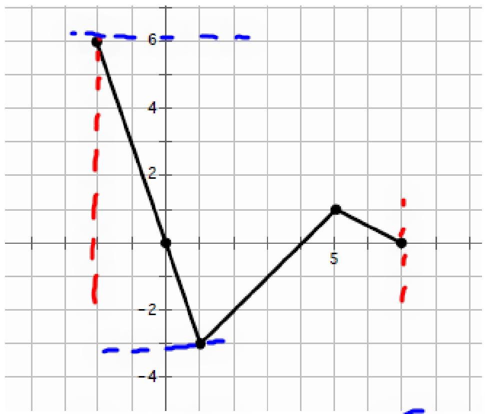
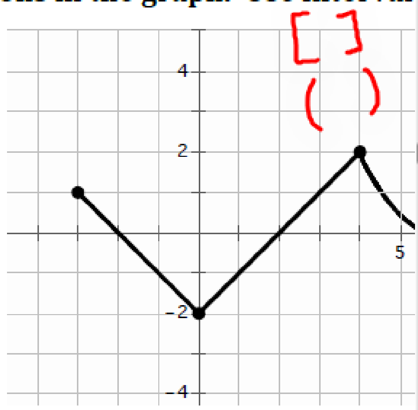
State the domain and range of the piece-wise functions in the graph. Use interval

13.



a. Domain: [-2,7] b. Range: [-3,6]

14.



a. Domain: b. Range:

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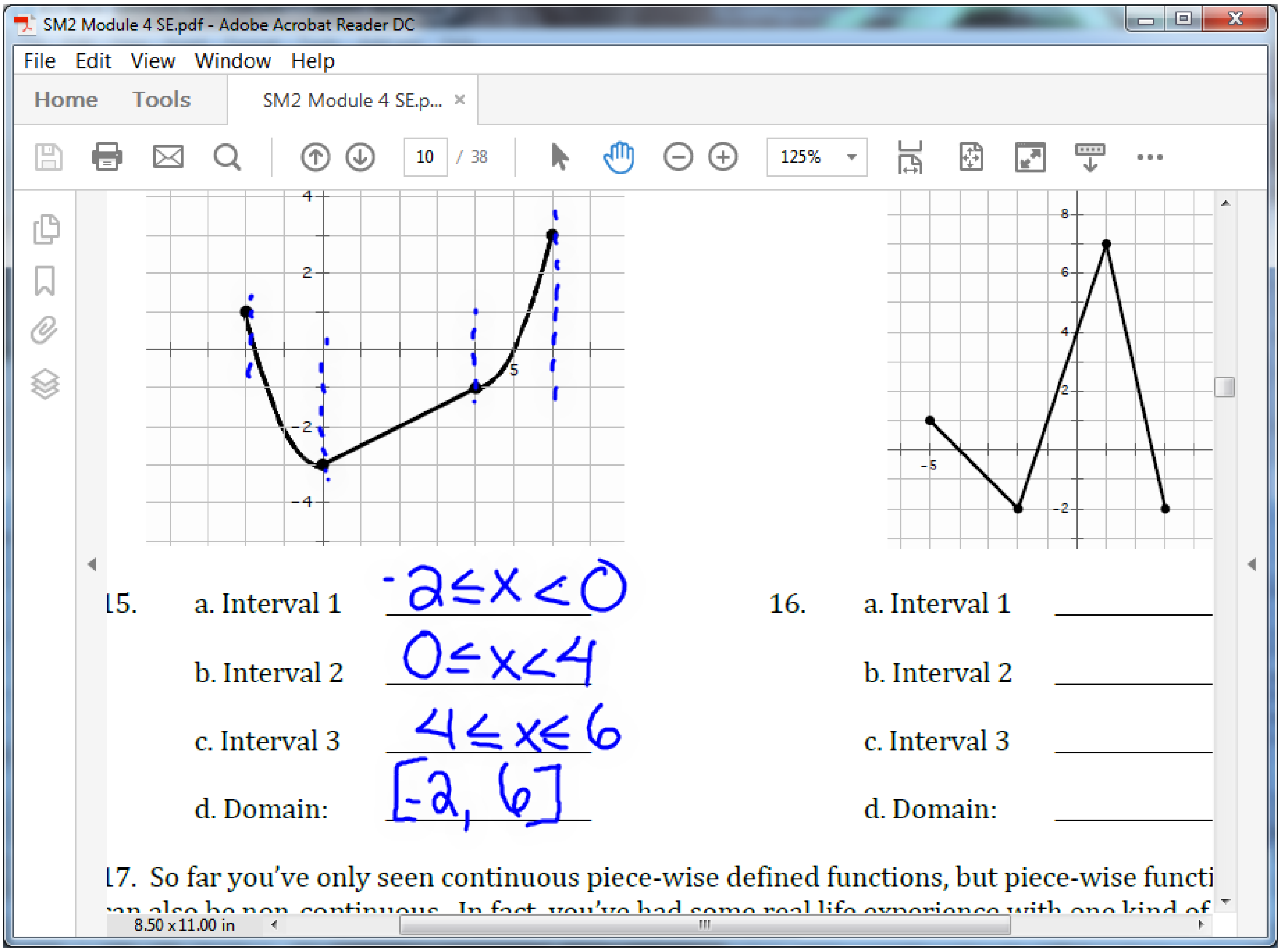


15. a. Interval 1 $-2 \le x < 0$

b. Interval 2 $0 \le x < 4$

c. Interval 3 $4 \le x \le 6$

d. Domain: $[-2, 6]$

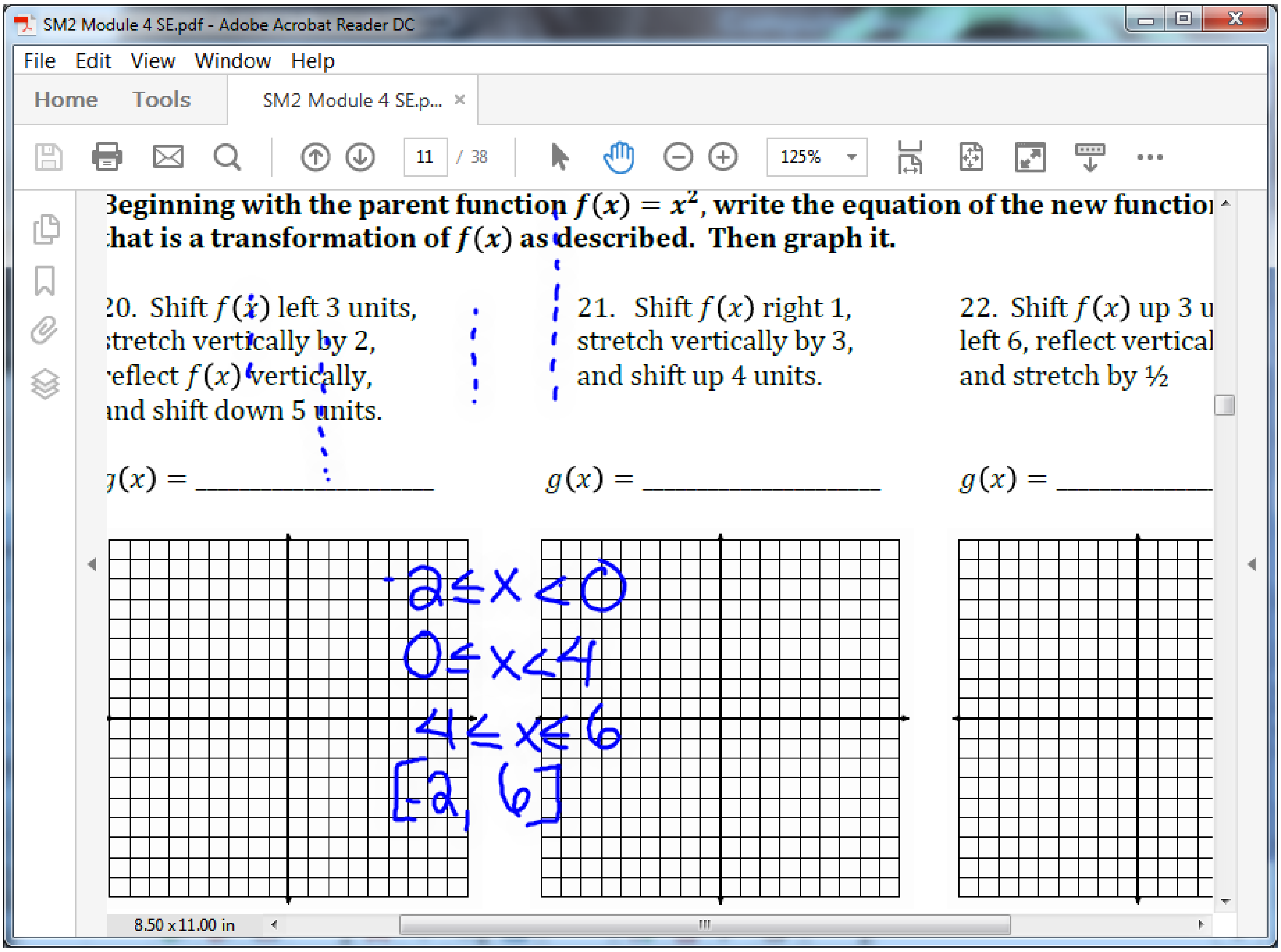
16. a. Interval 1 ______

b. Interval 2 ______

c. Interval 3 ______

d. Domain: ______

17. So far you've only seen continuous piece-wise defined functions, but piece-wise functi... can also be non-continuous. In fact, you've had some real life experience with one kind of...



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Beginning with the parent function $f(x) = x^2$, write the equation of the new function that is a transformation of $f(x)$ as described. Then graph it.

20. Shift $f(x)$ left 3 units, stretch vertically by 2, reflect $f(x)$ vertically, and shift down 5 units.

$g(x) =$ ______________

21. Shift $f(x)$ right 1, stretch vertically by 3, and shift up 4 units.

$g(x) =$ ______________

22. Shift $f(x)$ up 3 u... left 6, reflect vertical... and stretch by ½

$g(x) =$ ______________

$-2 \le x < 0$

$0 \le x < 4$

$4 \le x \le 6$

$[2, 6]$

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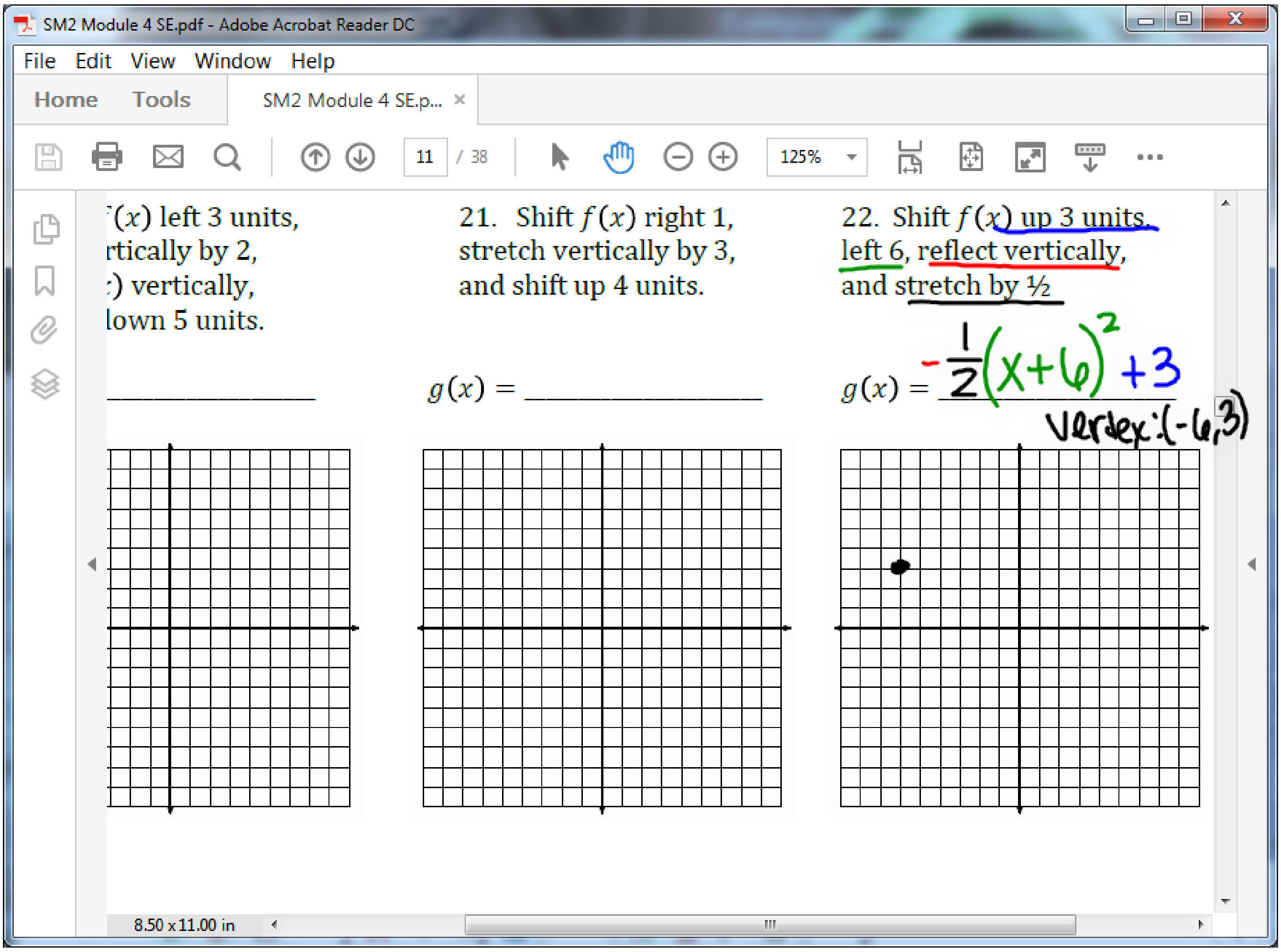
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…(x) left 3 units, …rtically by 2, …) vertically, …lown 5 units.

____

21. Shift $f(x)$ right 1, stretch vertically by 3, and shift up 4 units.

$g(x) =$ ______________

22. Shift $f(x)$ up 3 units, left 6, reflect vertically, and stretch by ½

$g(x) = -\frac{1}{2}(x+6)^2+3$

Vertex: (-6,3)

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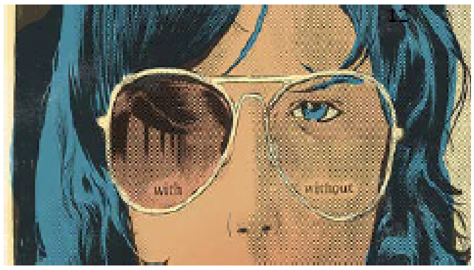


4.3 More Functions, with Features
A Solidify Understanding Task

Michelle likes riding her bike to and from her favorite lake on Wednesdays. She created the following graph to represent the distance she is away from the lake while biking.

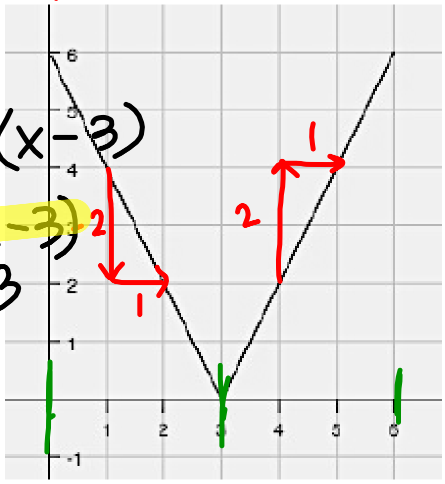
distance

(3,0)

$y-0=-2(x-3)$

$y=-2(x-3)$

$0\le x<3$



time

$y-0=2(x-3)$

$y=2(x-3)$

$3\le x\le 6$

1. Interpret the graph by writing three observations about Michelle's bike ride.

- V shape (Δ upside down)
- 2 parts
- slope: $-\frac{2}{1}$ for part, $\frac{2}{1}$ other part

2. Write a piece-wise function for this situation, with each linear function being in point-slope form using the point (3,0). What do you notice?

$$f(x)=\begin{cases}-2(x-3), & 0\le x<3\\ 2(x-3), & 3\le x\le 6\end{cases}$$

3. This particular piece-wise function is called a linear absolute value function. What are the traits you are noticing about linear absolute value functions?

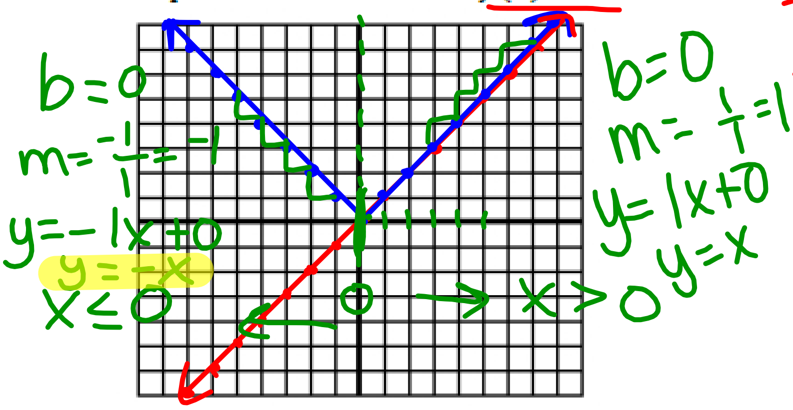
- V-shape
- symmetrical

Dec 8-1:20 PM

Part II

In this part of the task, you will solidify your understanding of piece-wise and use your knowledge of transformations to make sense of absolute value functions. Follow the directions and answer the questions below.

1. Graph the linear function $f(x) = x$



x	f(x)	g(x)=|f(x)| =|x|
-3	-3	3
-2	-2	2
-1	-1	1
0	0	0
1	1	1
2	2	2
3	3	3

2. On the same set of axes, graph $g(x) = |f(x)|$.

3. Explain what happens graphically from $f(x)$ to $g(x)$.

The part of f(x)=x where x<0 reflects across the x-axis.

4. Write the piece-wise function for $g(x)$. Explain your process for creating this piece-wise function and how it connects to your answer in question 3.

$$f(x) = \begin{cases} -x, & x \le 0 \\ x, & x > 0 \end{cases}$$

5. Create a table of values from [-4, 4] for *f(x)* and *g(x)*. Explain how this connects to your answer in questions 3 and 4.

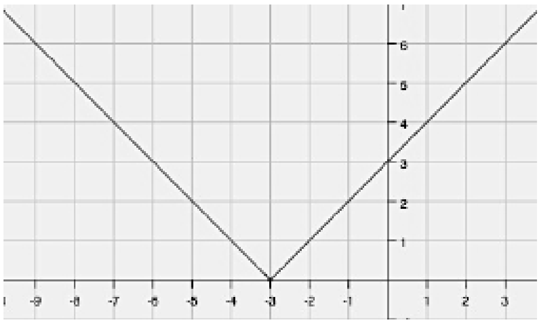
x	*f(x)*	*g(x)*
-4		
-3		
-2		
-1		
0		
1		
2		
3		
4		

Part III

6. The graph below is another example of an absolute value function. The equation of this function can be written two ways:

as an absolute value function: $f(x) = |x+3|$

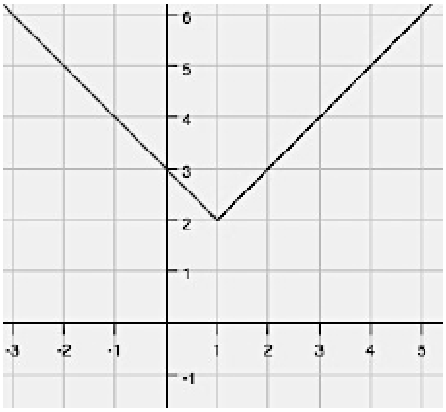
or as a piece-wise: $f(x) = \begin{cases} -(x+3), & x < -3 \\ (x+3), & x \geq -3 \end{cases}$



How do these two equations relate to each other?

Below are graphs and equations of more linear absolute value functions. Write the piece-wise function for each. See if you can create a strategy for writing these equations.

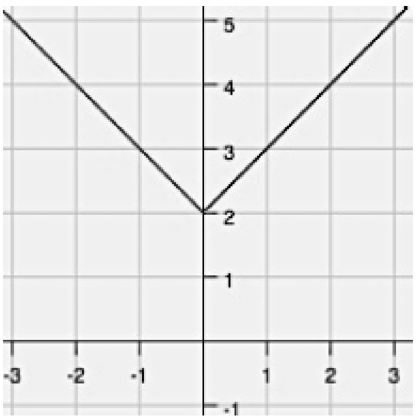
7.



Abolute value: $f(x) = |x-1| + 2$

Piece-wise: $f(x) =$

8.



Abolute value: $f(x) = |x| + 2$

Piece-wise: $f(x) =$

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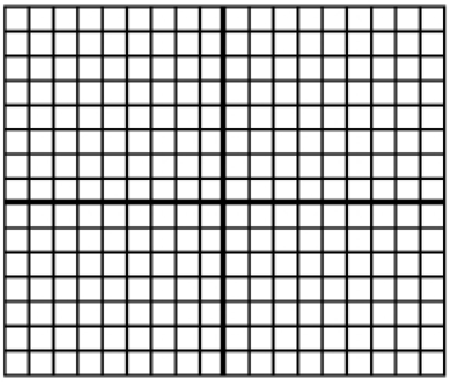
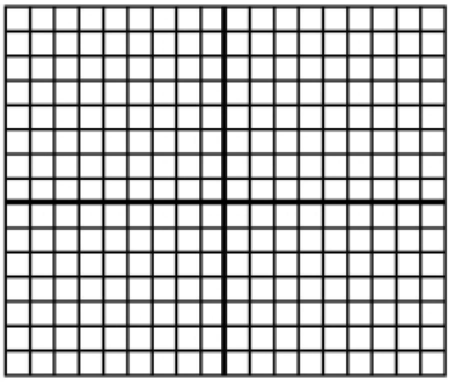
Graph the following linear absolute value piece-wise functions.

9. $f(x) = |x - 4| = \begin{cases} -(x-4), & x < 4 \\ (x-4), & x \geq 4 \end{cases}$



10. $f(x) = |x| + 1 = \begin{cases} -(x) + 1, & x < 0 \\ (x) + 1, & x \geq 0 \end{cases}$



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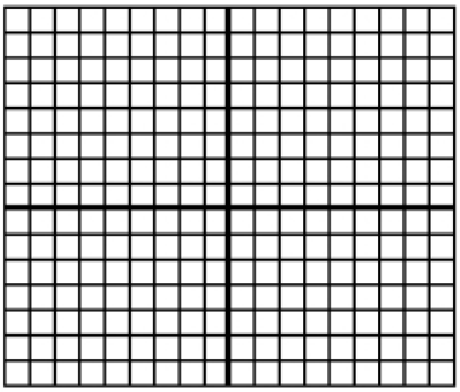

Piece-wise: $f(x) = \begin{cases} -3(x+2) + 1, & x < -2 \\ 3(x+2) + 1, & x \geq -2 \end{cases}$

Absolute Value: $f(x) =$

12. Explain your method for doing the following:

a) Writing piecewise linear absolute value functions from a graph.
b) Writing piecewise linear absolute value functions from an absolute value function.
c) Graphing absolute value functions (from either a piecewise or an absolute value equation).

Homework

Finish 4.3 "Ready, Set, Go"