Questions on 4.2 HW?

Apr 8-8:30 AM

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

1. $|x| = 7$

$x = 7, -7$

$|7| = 7$

$|-7| = 7$

$|-7| \neq -7$

2. $|x - 6| = 3$

$(x-6) = 3$
$+6 \quad +6$
$x = 9$

$-(x-6) = 3$
$-x + 6 = 3$
$-6 \quad -6$
$-x = -3$
$x = 3$

3. $|w + 4$

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

5. $|3d| = 15$

6. $|3x -$

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

8. $|-4m| = 64$

9. $2|x +$

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

$+1 \quad +1$
$5|c+3| = 10$
$\frac{5|c+3|}{5} = \frac{10}{5}$
$|c+3| = 2$

$(c+3) = 2$
$-3 \quad -3$
$c = -1$

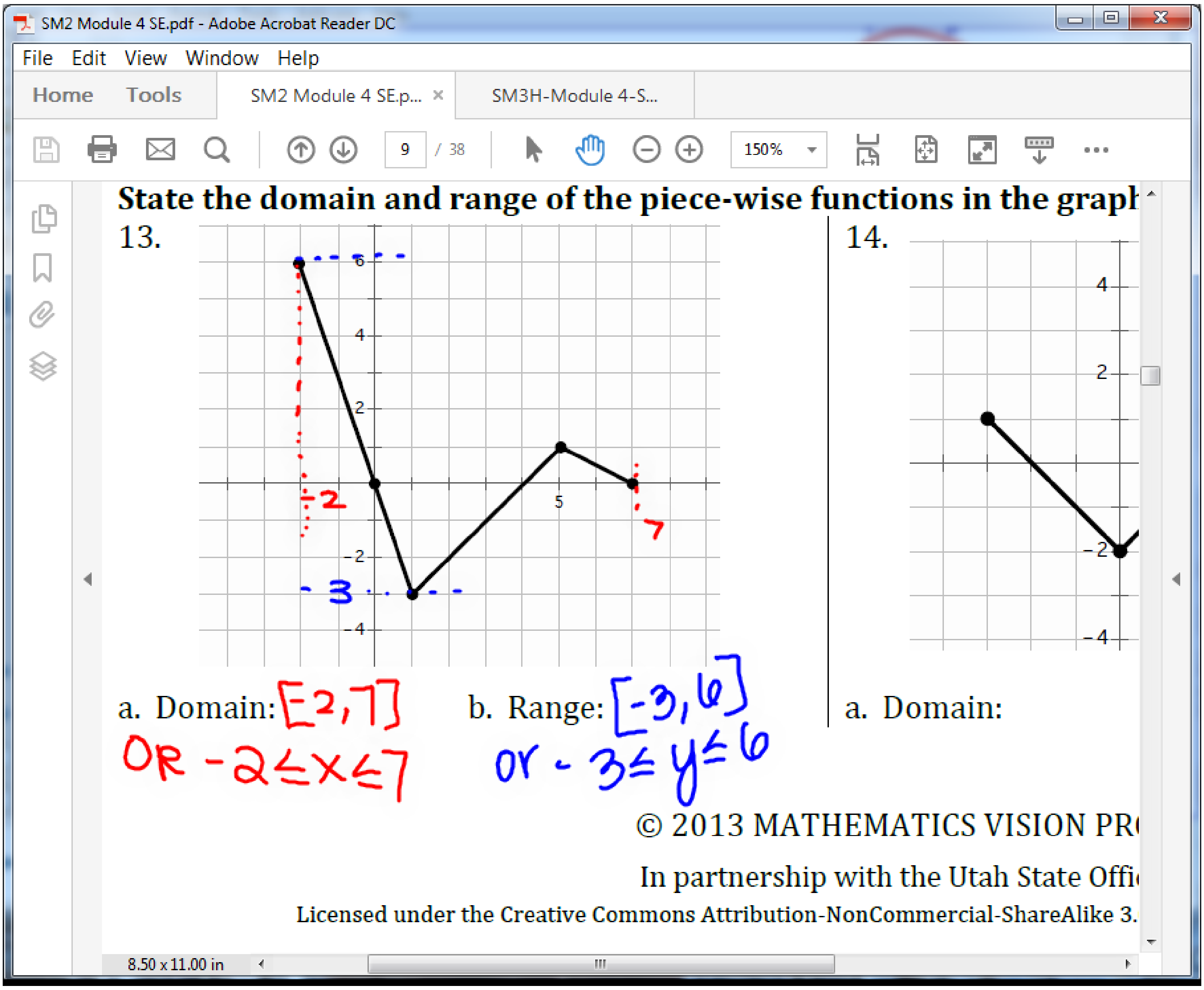
$-(c+3) = 2$
$-c - 3 = 2$
$+3 \quad +3$
$-1 \cdot -1c = 5 \cdot -1$
$c = -5$

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

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

Set

8.50 x 11.00 in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State the domain and range of the piece-wise functions in the graph

13.

a. Domain: $[-2,7]$ OR $-2 \le x \le 7$

b. Range: $[-3,6]$ or $-3 \le y \le 6$

14.

a. Domain:

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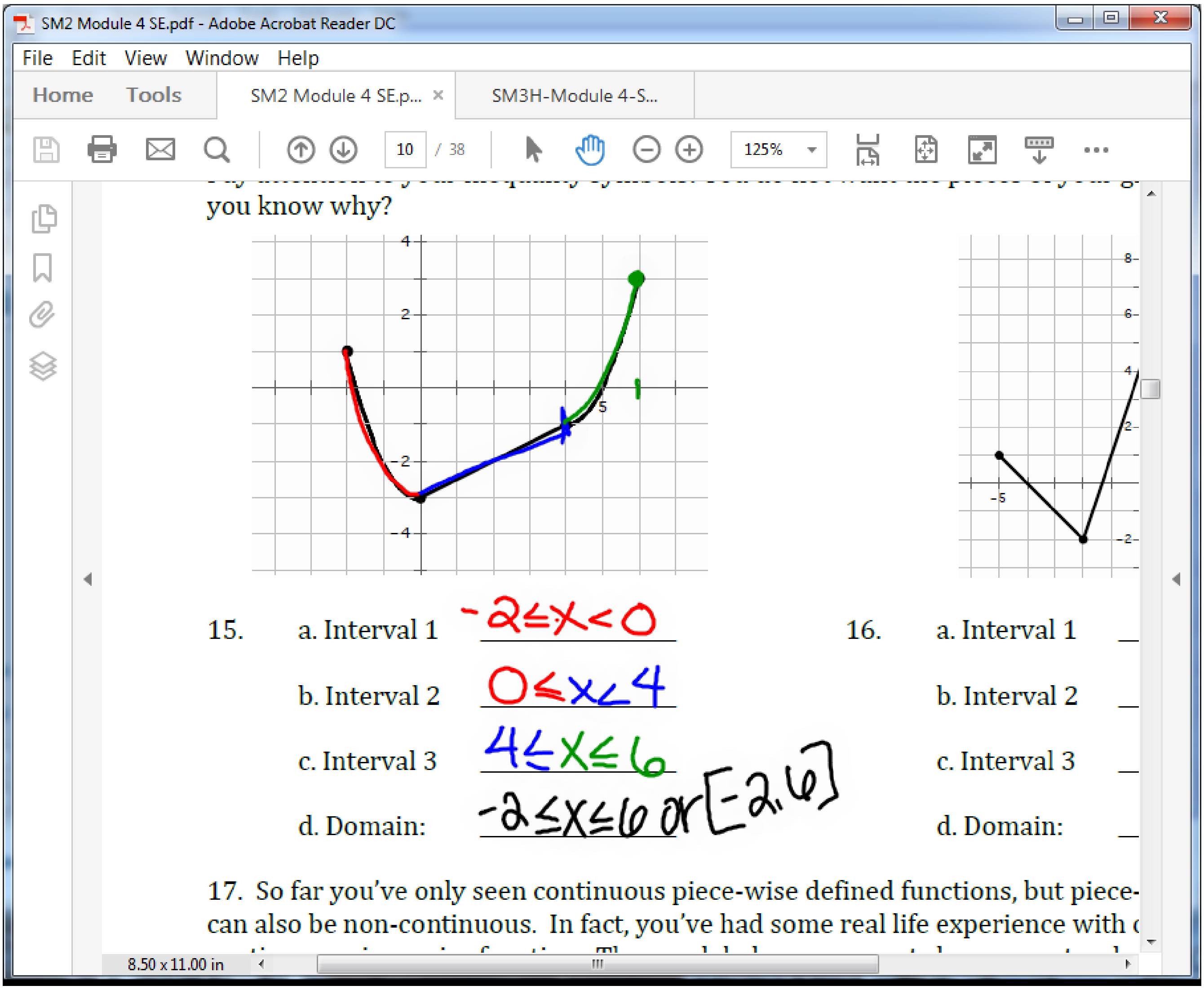

you know why?

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: $-2\le x\le 6$ or $[-2,6]$

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-
can also be non-continuous. In fact, you've had some real life experience with

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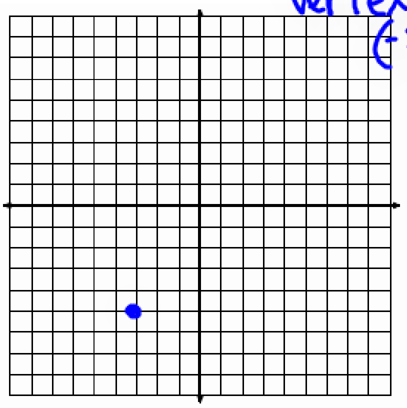
20. Shift $f(x)$ left 3 units, stretch vertically by 2, reflect $f(x)$ vertically, and shift down 5 units.

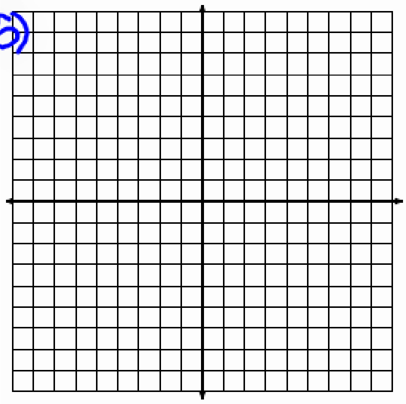
$g(x) = -2(x+3)^2-5$

vertex: (-3,-5)



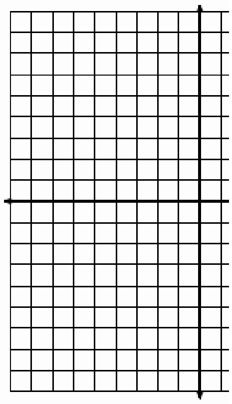
21. Shift $f(x)$ right 1, stretch vertically by 3, and shift up 4 units.

$g(x) =$ ________________



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

$g(x) =$ ________



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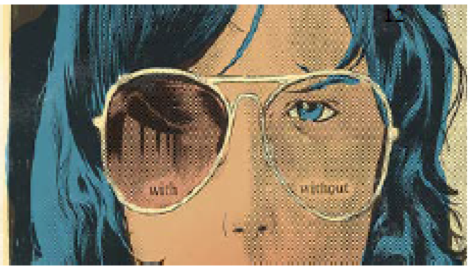
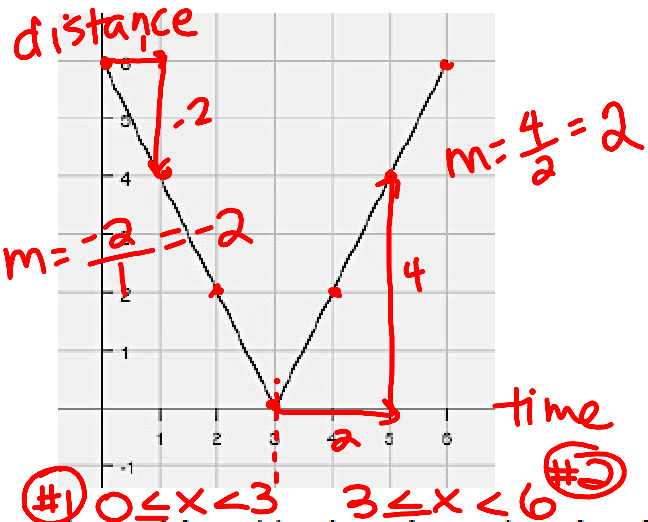


4.3 More Functions, with Features

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.



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

She doesn't rest at all.

2 parts

Decreasing part #1

Increasing part #2

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?

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

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

$y = m(x-3)$

*same eqn. except for (−)

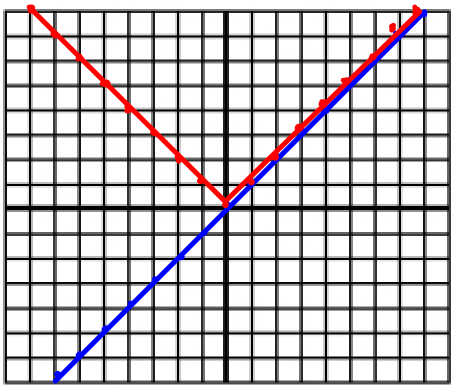
3. This particular piece-wise function is called a linear absolute value function. What are the traits you are noticing about linear absolute value functions?

symmetrical, opposite slopes (−2 & 2)

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 $f(x) = x$



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

$|f(x)| = |x| \Rightarrow$ all y-values will be +

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

left half, with all negative y-values reflected across x-axis and has all + y-values.

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.

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

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

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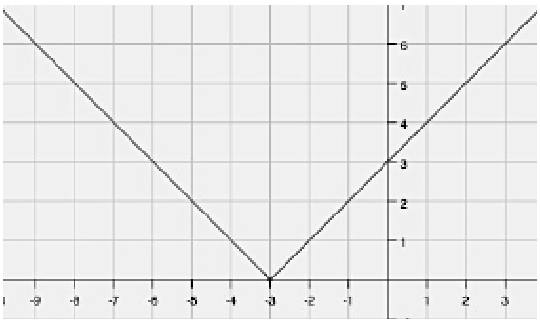
Part III

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



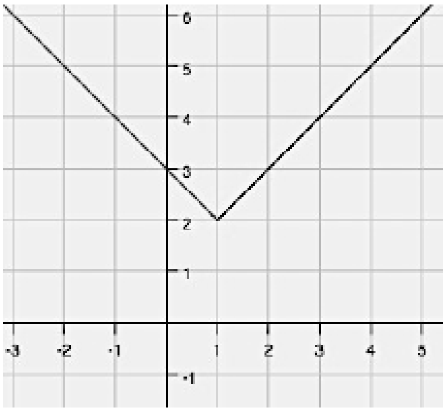
as an absolute value function: $f(x) = |x+3|$

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.

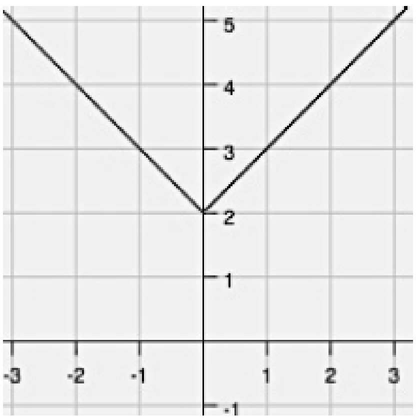
7.



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

Piece-wise: $f(x) =$

8.

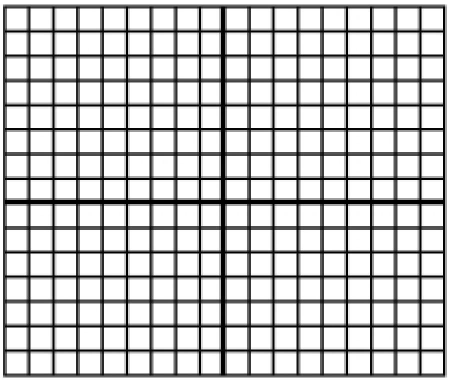


Abolute value: $f(x) = |x| + 2$

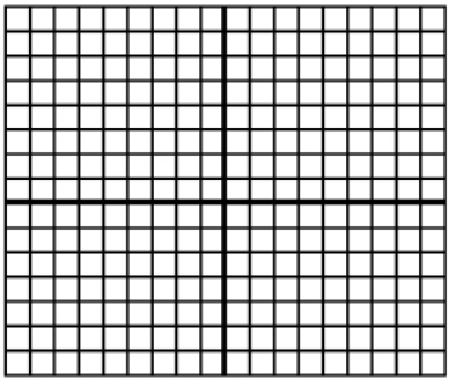
Piece-wise: $f(x) =$

Graph the following linear absolute value piece-wise functions.

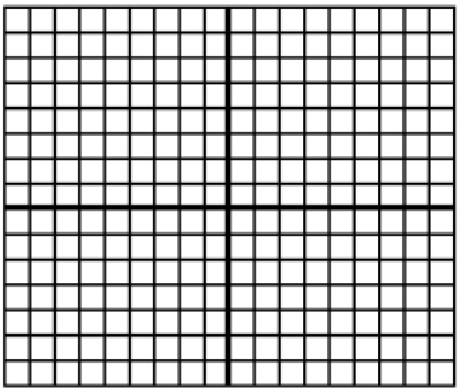
9. $f(x) = |x - 4| = \begin{cases} -(x-4), & x < 4 \\ (x-4), & x \geq 4 \end{cases}$



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



11.



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"