UNIT 1 - Lesson 2

Name Period Date

READY

Topic: Evaluating absolute value expressions.

Evaluate each expression.

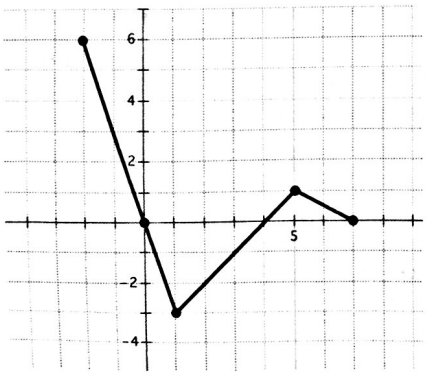
1. $|4| = 4$
2. $|-6| = 6$
3. $|0| = 0$
4. $|11^2 - 16| = 105$
5. $f(-2)$ *if* $f(x) = |7x + 23|$
   $= |7(-2) + 23| = 9$
6. $g(3)$ *if* $g(x) = 2|x - 7| + 1$
   $= 2|3 - 7| + 1$
   $= 9$
7. What does it mean to say *the absolute value of a number is less than 5*?
   It means that number is less than 5 units away from zero on the number line.

SET

Topic: Reading the domain and range from a graph

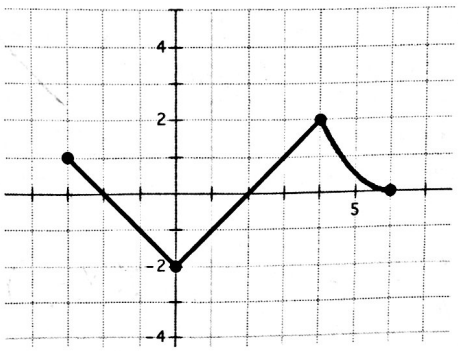
State the domain and range of the piece-wise functions in the graph. Use interval notation.

8.



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

9.



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

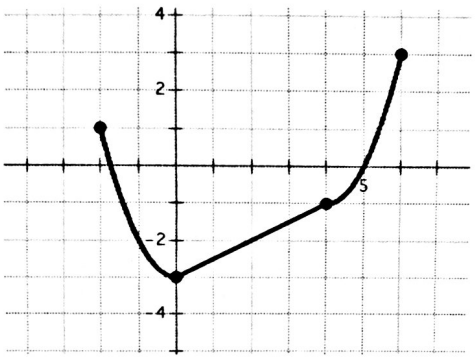
For each of the graphs below write the interval that defines each piece of the graph. Then write the domain of the entire piece-wise function.

9

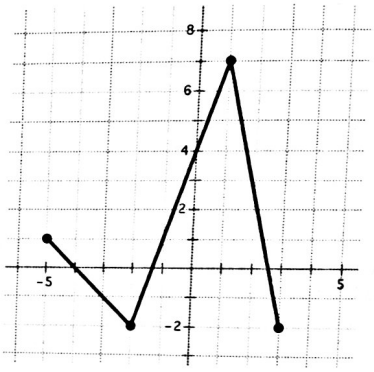
* **Example:** (Look at the graph in #11. Moving left to right. Piece-wise functions use set notation.)

Interval 1 $-3 \leq x < 0$
Interval 2 $0 \leq x < 4$
Interval 3 $4 \leq x \leq 6$
Domain: $[-3,6]$ (We can use interval notation on the domain, if it's continuous.)

Pay attention to your inequality symbols! You do not want the pieces of your graph to overlap. Do you know why?



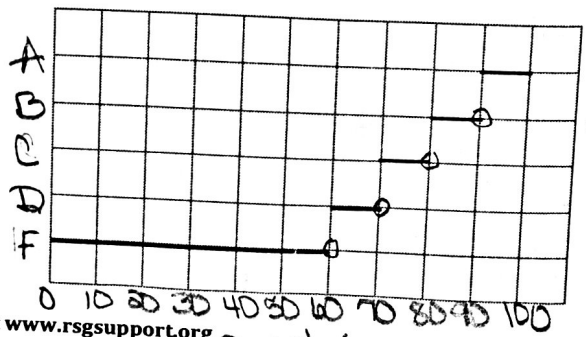
10. a. Interval 1 $-2 \leq x < 0$
b. Interval 2 $0 \leq x < 4$
c. Interval 3 $4 \leq x \leq 6$
d. Domain: $[-2,6]$



11. a. Interval 1 $-5 \leq x < -2$
b. Interval 2 $-2 \leq x < 1$
c. Interval 3 $1 \leq x \leq 3$
d. Domain: $[-5,3]$

12. So far you've only seen continuous piece-wise defined functions, but piece-wise functions can also be non-continuous. In fact, you've had some real life experience with one kind of non-continuous piece-wise function. The graph below represents how some teachers calculate grades. Finish filling in the piece-wise equation. Then label the graph with the corresponding values.

$$f(x) = \begin{cases} A, & 90 \leq x \leq 100 \\ B, & 80 \leq x < 90 \\ C, & 70 \leq x < 80 \\ D, & 60 \leq x < 70 \\ F, & 0 \leq x < 60 \end{cases}$$



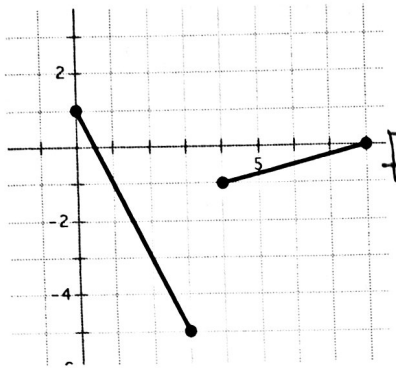
* label axes w/ students

Grades

mathematics vision project

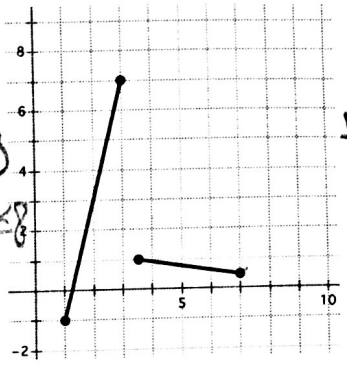
Write the piece-wise functions for the given graphs.

13H.



$f(x) = \begin{cases} -2x+1, & 0 \le x \le 3 \\ \frac{1}{4}(x-4)-1, & 4 \le x \le 8 \end{cases}$ or $\frac{1}{4}x-2$

14H.



$f(x) = \begin{cases} 4(x-1)-1, & 1 \le x \le 3 \\ -\frac{1}{4}(x-3.5)+1, & 3.5 \le x \le 4 \end{cases}$

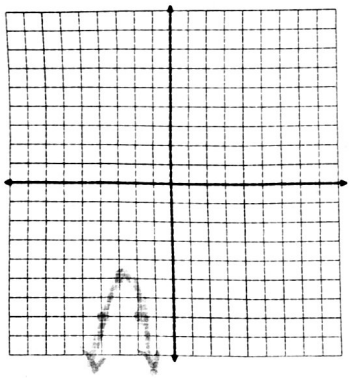
GO

Topic: Transformations on quadratic equations

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

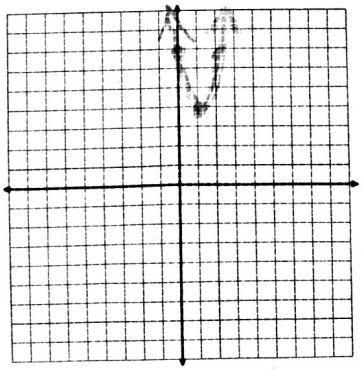
15. Shift $f(x)$ left 3 units, stretch vertically by 2, reflect $f(x)$ vertically, and shift down 5 units.

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



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

$g(x) = 3(x-1)^2 + 4$



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

*think?

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