Unit #5: Limits
Topic: Piecewise Functions
Objective: SWBAT graph a piecewise function and determine values of the function at indicated points.

Warm Up #1:

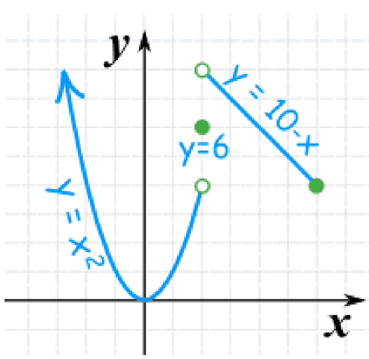
If $(x) = \begin{cases} x^2 - 1, & x < -2 \\ 3, & -2 \le x < 1 \\ 4x + 5, & x \ge 1 \end{cases}$, find the value for each of the following:

a) $f(1) =$	b) $f(-6) =$	c) $f(0) =$	d) $f(7) =$

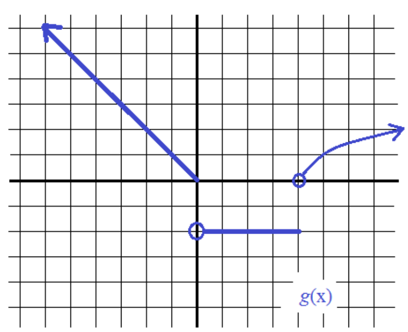
A ____ is a function that is defined in pieces by two or more equations over a given domain.

Examples:

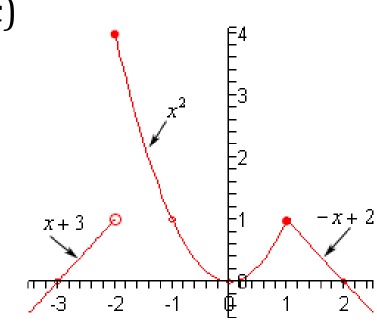
a)



b)



c)



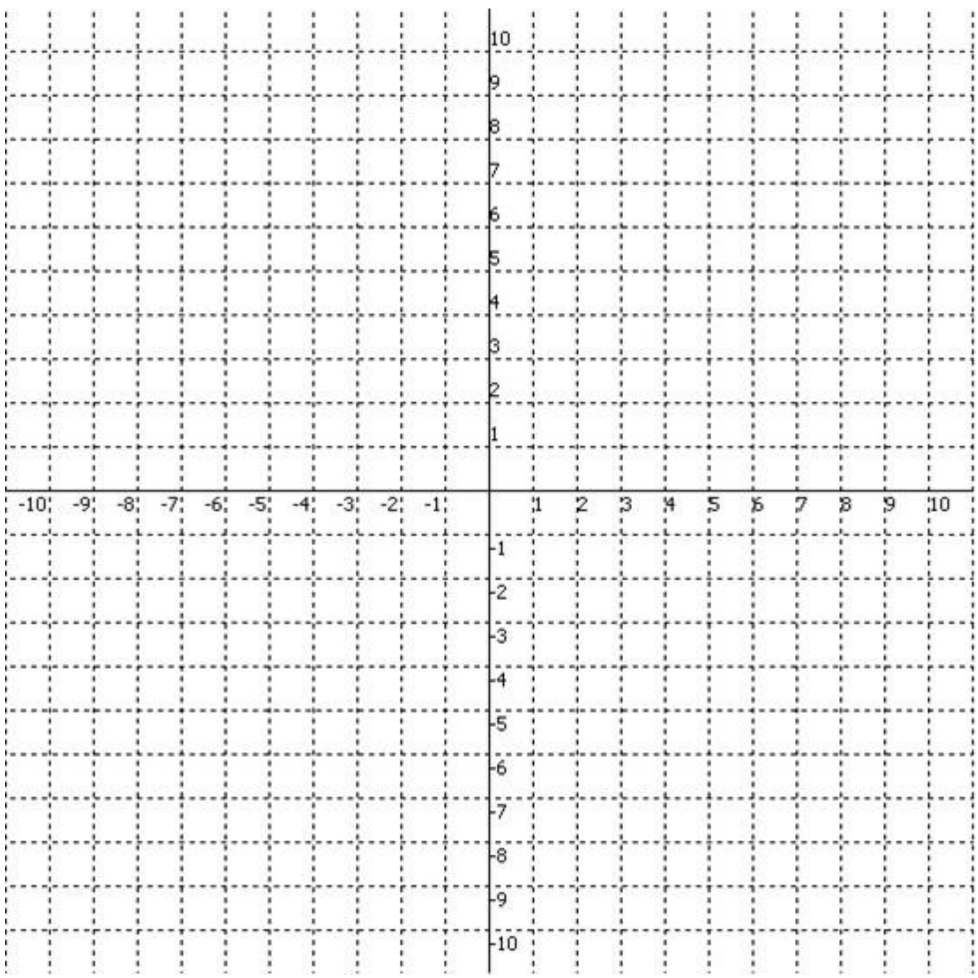
Graphing Piecewise Functions:

Since piecewise functions are defined in pieces, then you have to graph them in pieces too.

Model Problem:

Graph each of the following piecewise functions and then identify the indicated values.

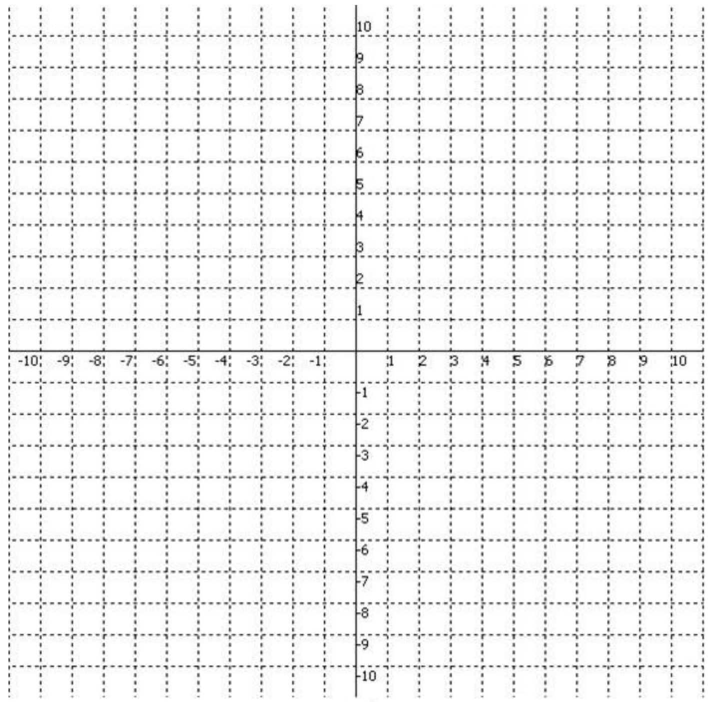
$$f(x) = \begin{cases} -2|x+1|, & x \le 1 \\ 3, & 1 < x < 3 \\ 6 - 2x, & x \ge 3 \end{cases}$$



$f(10) =$ $\qquad$ $f(2) =$ $\qquad$ $f(0) =$

Problem Set #1: Graph each of the following piecewise functions and then identify the indicated values.

1. $f(x) = \begin{cases} 2x + 1, & x \geq 1 \\ x^2 + 3, & x < 1 \end{cases}$

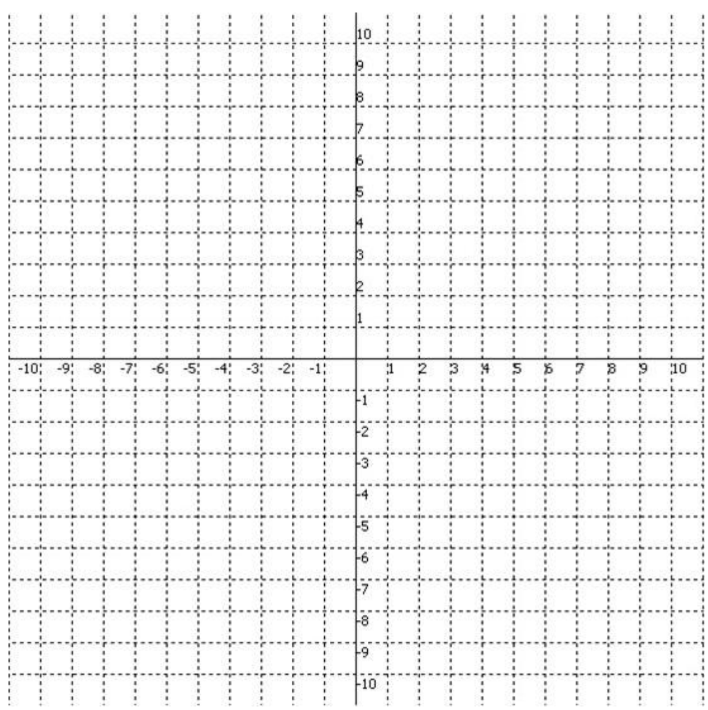


$f(-3) =$

$f(1) =$

$f(5) =$

2. $f(x) = \begin{cases} -x^2 + 2x, & x \leq 2 \\ \sqrt{x-2}, & x > 2 \end{cases}$

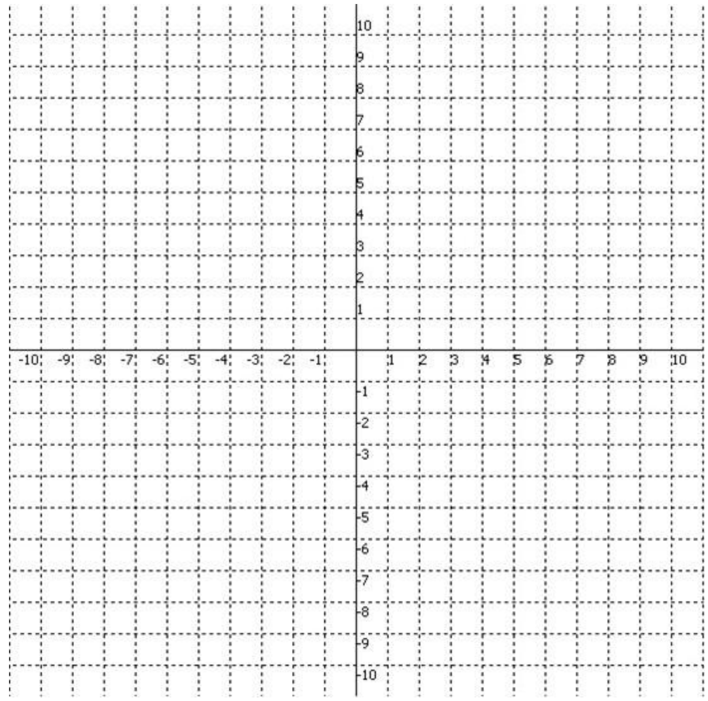


$f(-1) =$

$f(2) =$

$f(6) =$

3. $f(x) = \begin{cases} |2x+4|, & x < 1 \\ 2, & 1 \le x < 3 \\ -x+3, & x \ge 3 \end{cases}$

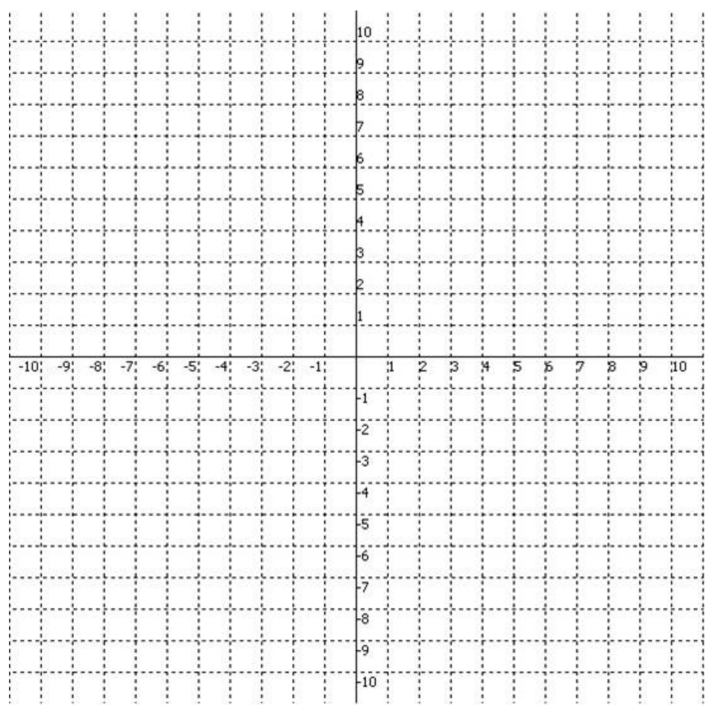


$f(-3) =$

$f(1) =$

$f(3) =$

4. $f(x) = \begin{cases} x^2 - 1, & x \le 0 \\ \sqrt{x+1}, & 0 < x \le 3 \\ 1, & x > 3 \end{cases}$



$f(0) =$

$f(3) =$

$f(5) =$

Name ____ **Date** ________________

Homework – Graphing Piecewise Functions

Evaluate the following for $f(x)=\begin{cases}3x-5, & x>4\\ x^2, & x\le 4\end{cases}$:

1. f(7)
2. f(4)
3. f(-3)

Evaluate the following for $f(x)=\begin{cases}-2|x+1|, & x\le 1\\ 3, & 1<x<3\\ 6-2x, & x\ge 3\end{cases}$:

4. f(10)
5. f(2)
6. f(0)

Graph the following piecewise functions.

7. $f(x)=\begin{cases}3+x, & x<0\\ x^2+1, & x\ge 0\end{cases}$

8. $g(x)=\begin{cases}x^2-5, & x<0\\ 1, & 0<x<2\\ 2-x, & x>3\end{cases}$