

Carefully graph each of the following. State the domain and range of each piecewise function. Then, evaluate the graph at any specified domain value.

1.  $f(x) = \begin{cases} x+5 & x < -2 \text{ LINE left} \\ x^2+2x+3 & x \geq -2 \text{ QUAD. Right} \end{cases}$

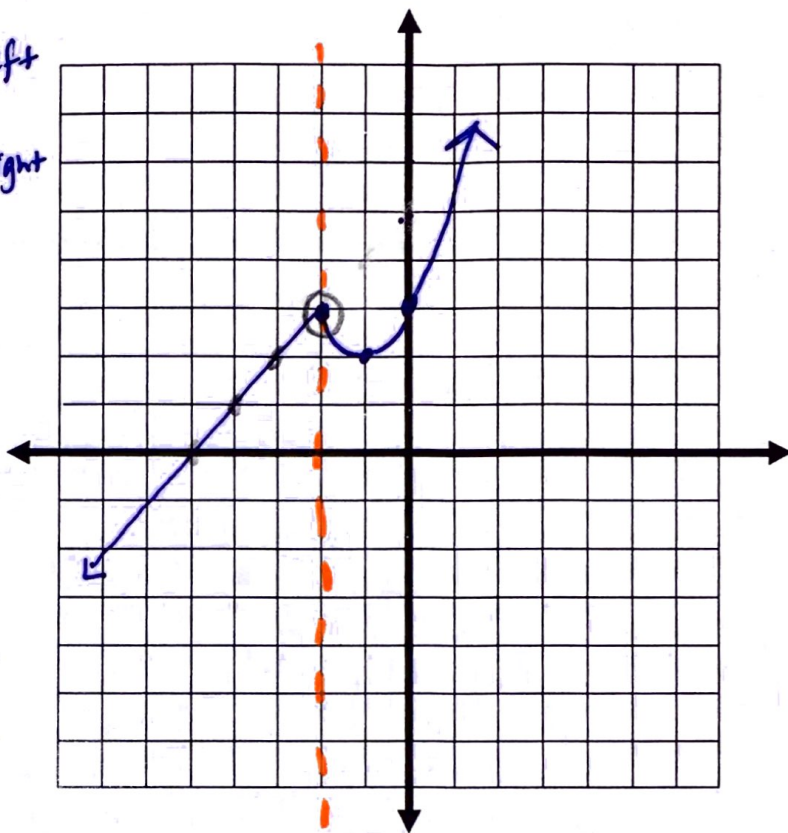
$f(3) = 3^2 + 2(3) + 3 = 18$

$f(-4) = 1$

$f(-2) = 3$

Domain:  $\{x | x = \mathbb{R}\}$

Range:  $\{y | y = \mathbb{R}\}$



	x	y
x+5	-4	1
	-3	2
	-2	3
x^2+2x+3	-2	3
	-1	2
	0	3
	1	6

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

$f(-2) = 7$

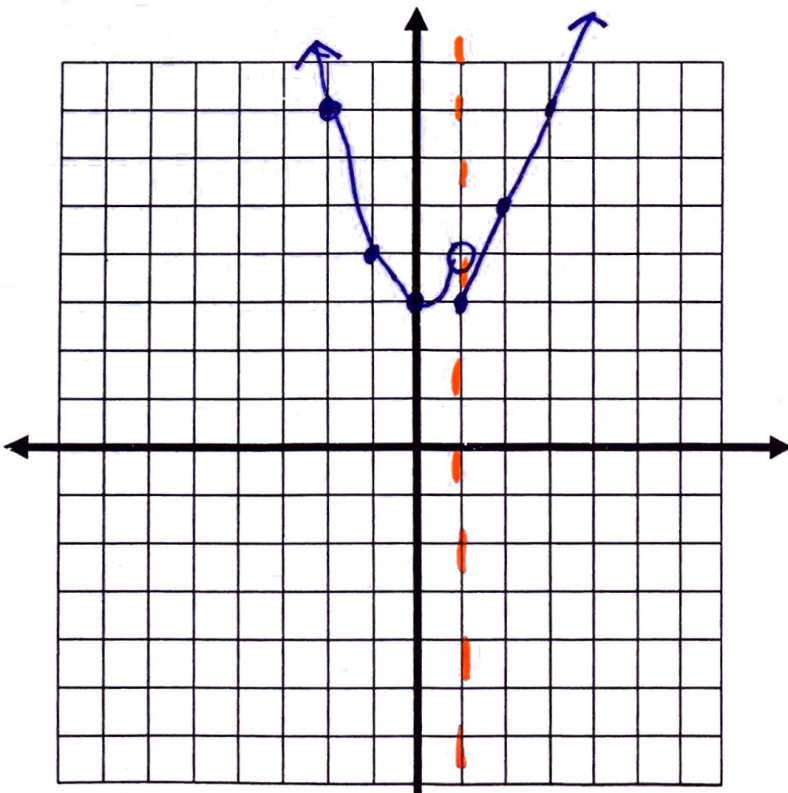
$f(6) = 13$

$f(1) = 3$

Domain:  $\{x | x = \mathbb{R}\}$

Range:  $\{y | y \geq 3\}$

	x	y
x^2+3	-2	7
	-1	4
	0	3
2x+1	1	3
	2	5
	3	7



$$7. f(x) = \begin{cases} -1, & \text{if } x \leq -3 \text{ left} \\ |x| - 2, & \text{if } -2 < x < 4 \text{ middle} \\ \frac{1}{2}x, & \text{if } x \geq 4 \text{ right} \end{cases}$$

$$f(-4) = -1$$

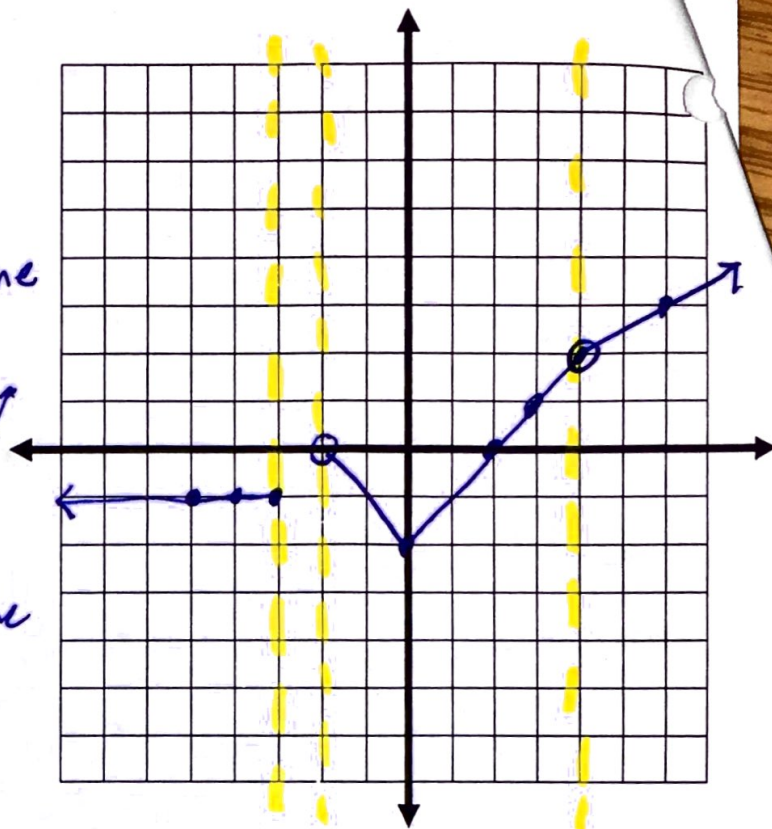
$$f(0) = -2$$

$$f(3) = 1$$

x	y
-5	-1
-4	-1
-3	-1
-2	0
0	-2
2	0
4	2
4	2
6	3

Domain: \_\_\_\_\_

Range: \_\_\_\_\_



$$D: \{x \mid x \leq -3 \text{ or } x > -2\}$$

$$R: \{y \mid y \neq -2\}$$

$$8. f(x) = \begin{cases} 0, & \text{if } -5 \leq x < -2 \\ -x^2 + 4, & \text{if } -2 \leq x \leq 1 \\ -x + 3, & \text{if } 4 < x \leq 7 \end{cases}$$

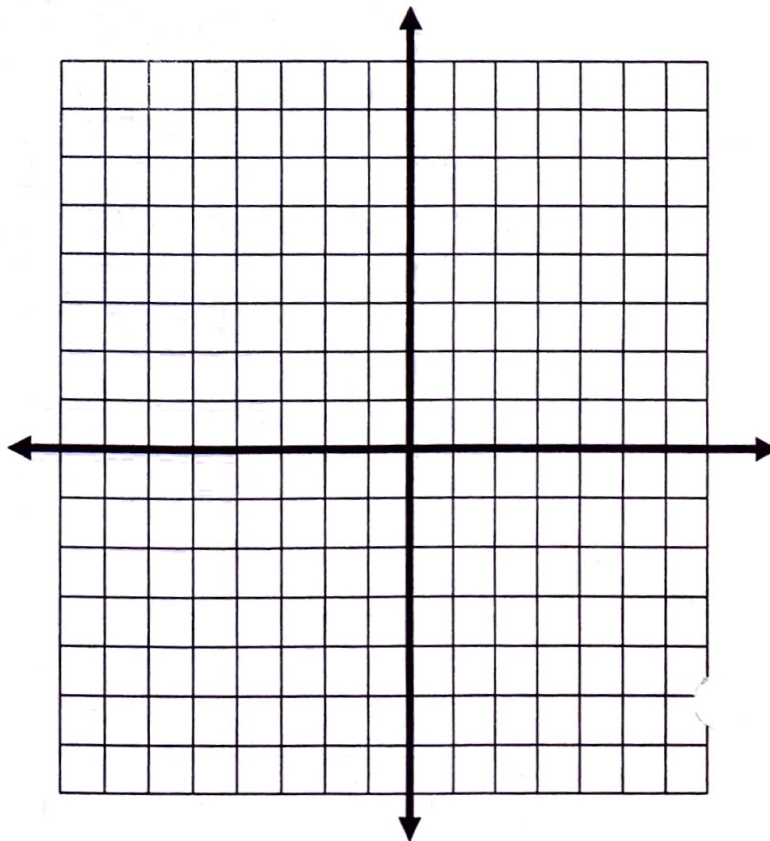
$$f(-2) =$$

$$f(0) =$$

$$f(5) =$$

Domain: \_\_\_\_\_

Range: \_\_\_\_\_



Honors Math 3  
Evaluating Piecewise Functions

1. Given the graph of  $f(x)$ , evaluate the following:

a)  $f(2) = -5$

b)  $f(-3) = 3$

c)  $3f(0) = -9$

d)  $f(7) + 5 = 7$

e)  $2f(-5) - f(2) = -5$

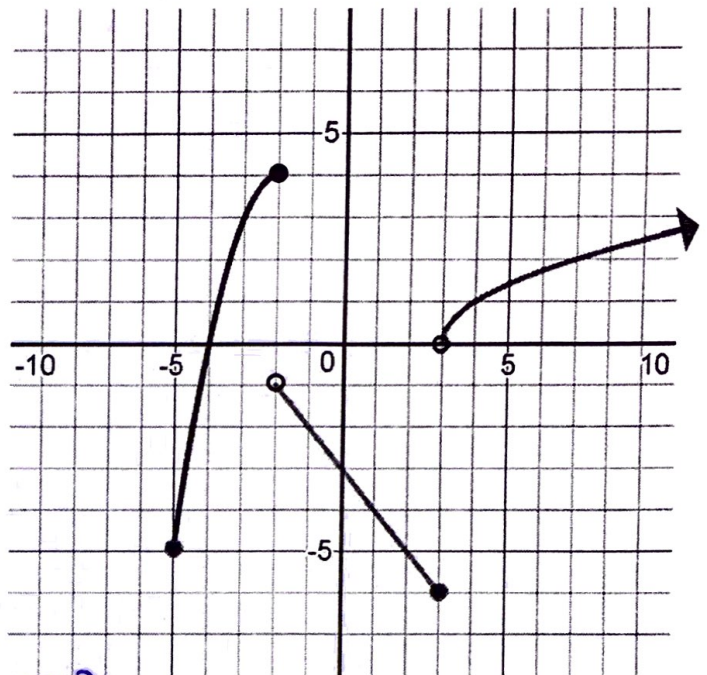
f)  $f(2) + \frac{1}{2}f(7) - f(0) = -1$

g) What is the domain of  $f(x)$ ?

$\{x \mid x \geq -5\}$

h) What is the range of  $f(x)$ ?

$\{y \mid y \geq -6\}$



2. Given the function  $g(x)$ , evaluate the following:

$$g(x) = \begin{cases} -4, & x < -1 \\ -2|x| + 5, & -1 \leq x < 2 \\ \sqrt{x+7} - 2, & x \geq 2 \end{cases}$$

left  
middle  
right

a)  $g(2) = \sqrt{2+7} - 2 = \sqrt{9} - 2 = 3 - 2 = 1$  (right)

b)  $g(-3) = -4$

c)  $-3g(1) = -3(-2|1| + 5) = -3(-2 + 5) = -3(3) = -9$

d)  $g(9) + 5 = \sqrt{9+7} - 2 + 5 = 4 - 2 + 5 = 7$

e)  $2g(-5) - g(2) = 2(-4) - 1 = -9$

f)  $g(2) + \frac{1}{2}g(9) - g(0) = 1 + \frac{1}{2}(2) - 5 = -3$

g) What is the domain of  $g(x)$ ?  
 $\{x \mid x \in \mathbb{R}\}$