

* Day 2 - Quadratic Piecewise Functions: Graphing, Writing and Applications

Name _____ Hour _____

Sketch each piecewise function. Find the domain and range for each piecewise function. Then, evaluate the graph at the specified domain value.

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

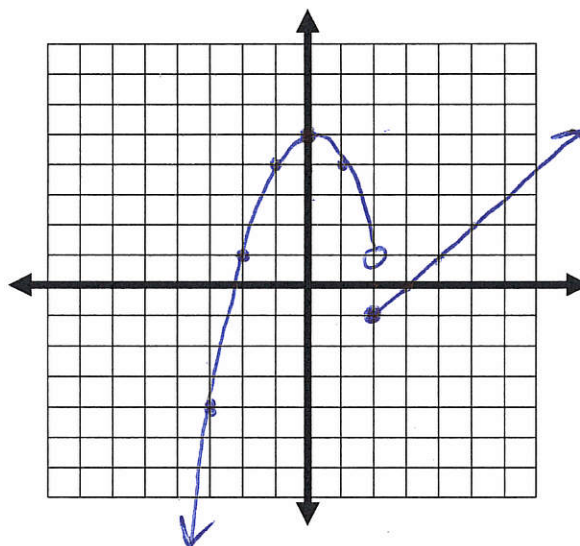
Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

$f(-3) = -4$

$f(0) = 5$

$f(2) = -1$



2. $f(x) = \begin{cases} -(x+3)^2 & x < -1 \\ \frac{1}{2}x - 4 & -1 \leq x \leq 2 \\ -5 & x > 2 \end{cases}$

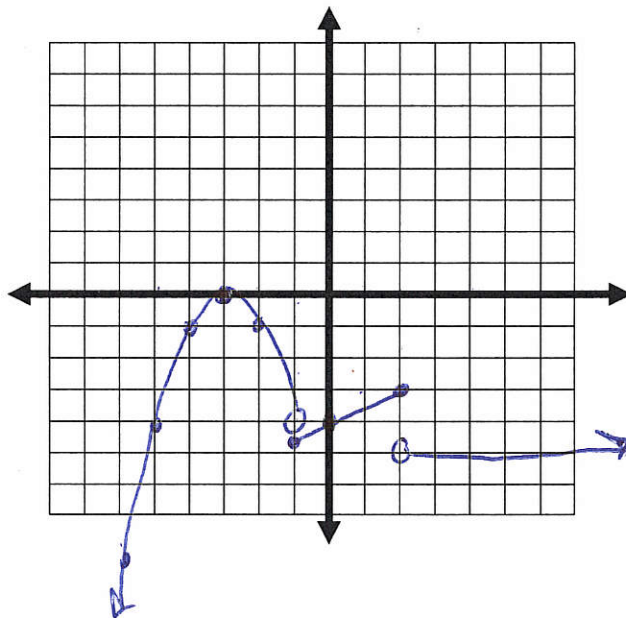
Domain: $(-\infty, \infty)$

Range: $(-\infty, 0]$

$f(-2) = -1$

$f(2) = -3$

$f(4) = -5$



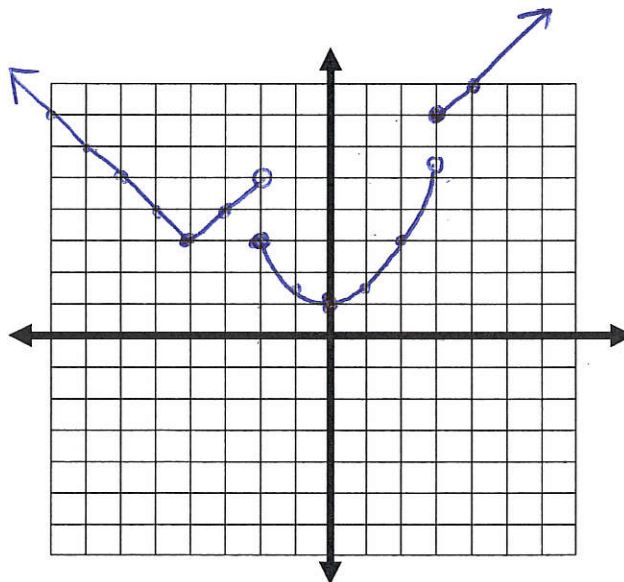
3. $f(x) = \begin{cases} |x+4| + 3 & x < -2 \\ \frac{1}{2}x^2 + 1 & -2 \leq x < 3 \\ x + 4 & x \geq 3 \end{cases}$

Domain: $(-\infty, \infty)$

Range: $[1, \infty)$

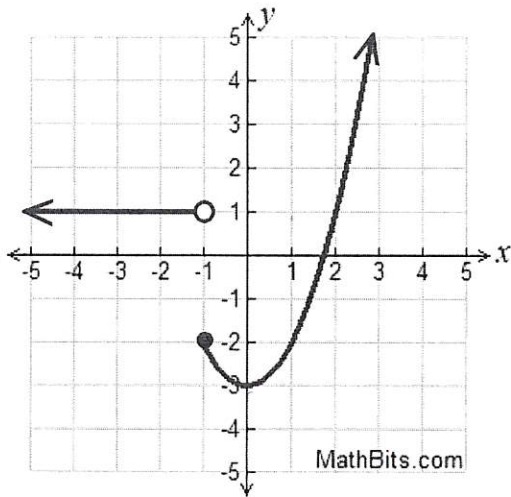
$f(-2) = 3$

$f(3) = 7$



Write a piecewise function for each graph and give the domain and range.

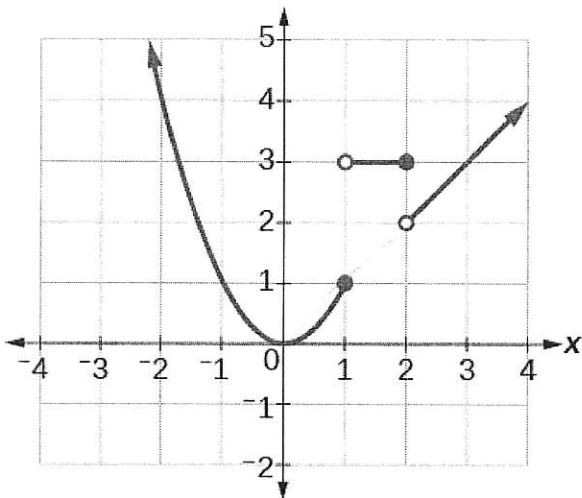
4.



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

Domain $(-\infty, \infty)$ or \mathbb{R} Range $[-3, \infty)$
 $y \geq -3$

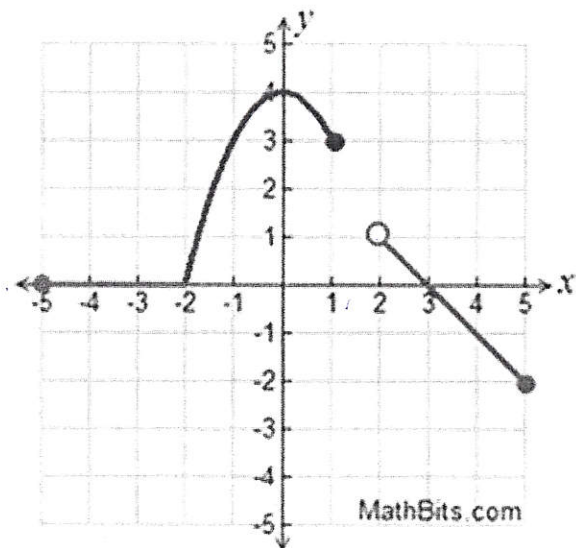
5.



$$f(x) = \begin{cases} x^2, & x \leq 1 \\ 3, & 1 < x \leq 2 \\ x, & x > 2 \end{cases}$$

Domain $(-\infty, \infty)$ or \mathbb{R} Range $[0, \infty)$
 $y \geq 0$

6.



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

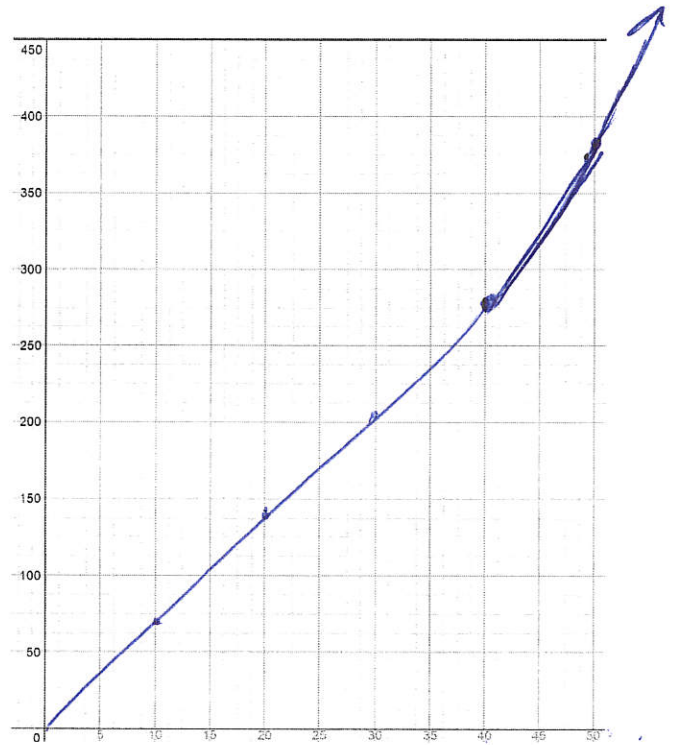
Domain $[-5, 1] \cup (2, 5]$ Range $[-2, 4]$
 $-5 \leq x \leq 1$ and $2 < x \leq 5$ $-2 \leq y \leq 4$

7. You have a summer job that pays time and a half for overtime. (i.e. if you work more than 40 hours). After that it is 1.5 times your hourly rate of \$7.00/hr.

a. Write a piecewise function that gives your weekly pay P in terms of the number of hours you worked h .

$$P(h) = \begin{cases} 7x, & 0 < x \leq 40 \\ 10.5x - 140, & x > 40 \end{cases}$$

b. Graph your piecewise function.



c. How much will you make if you work 45 hours?

$$10.5(45) - 140 = \$332.50$$

10	70
20	140
30	210
40	280
50	
60	

$$280 + 10.5(10) = 280 + 105 = 385$$

$$280 + 10.5(20) = 490$$

$$y - 385 = 10.5(x - 50)$$

$$y - 385 = 10.5x - 525 + 385$$

$$y + 385 = 10.5x - 140$$

$$y = 10.5x - 140$$