Day 1 - Quadratic Piecewise Functions: Graphing, Writing and Applications

Name Key Hour

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

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

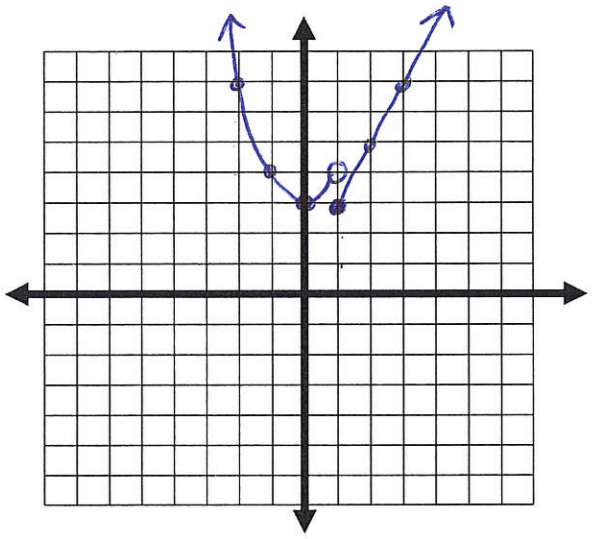
Domain: $(-\infty, \infty)$

Range: $[3, \infty)$

$f(-2) = 7$

$f(6) = 13$

$f(1) = 3$



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

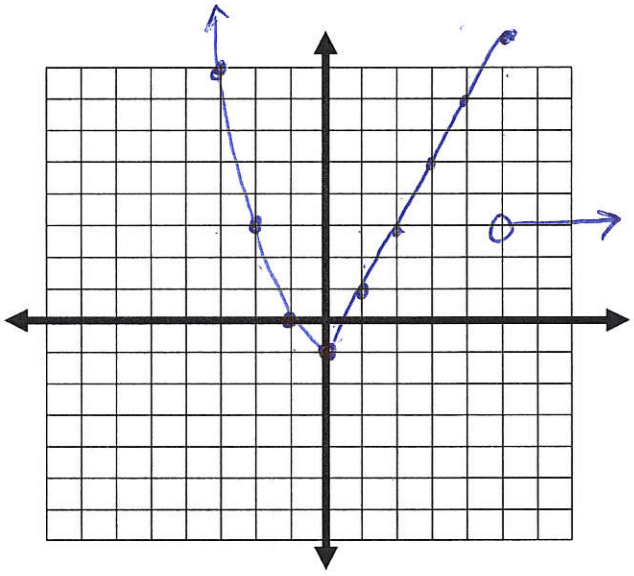
Domain: $(-\infty, \infty)$

Range: $[-1, \infty)$

$f(-2) = 3$

$f(0) = -1$

$f(5) = 9$



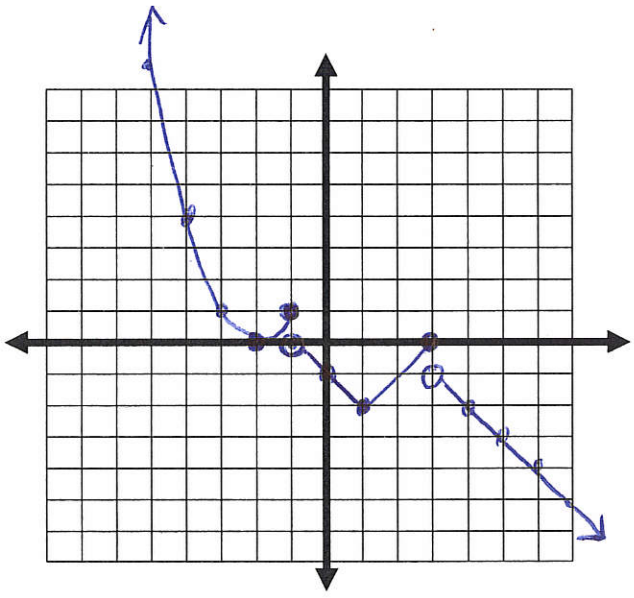
3. $f(x) = \begin{cases} (x+2)^2 & x \leq -1 \\ |x-1| - 2 & -1 < x \leq 3 \\ -x+2 & x > 3 \end{cases}$

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

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

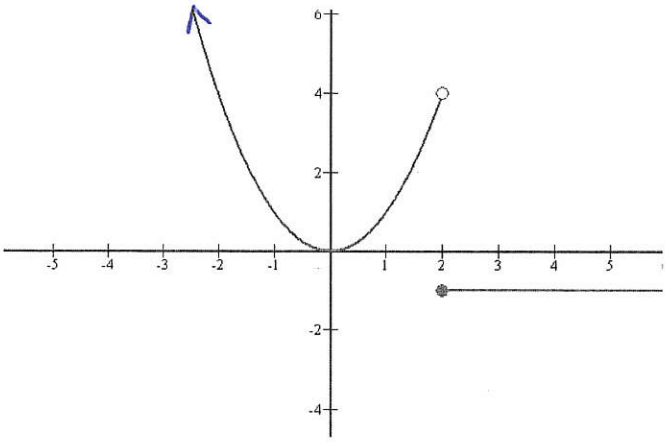
$f(-1) = 1$

$f(6) = -4$



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

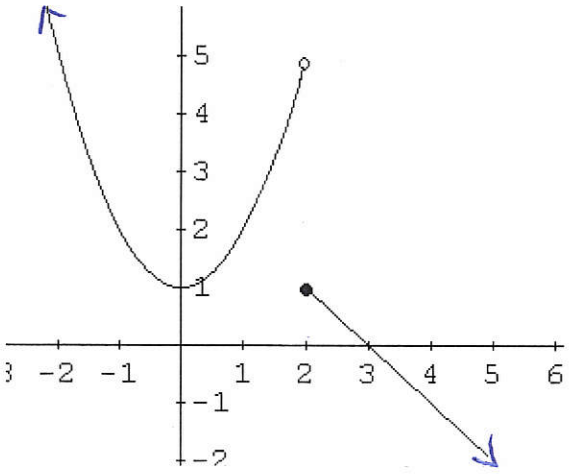
4.



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

Domain $(-\infty, \infty)$ or $\mathbb{R}$ **Range** $[-1], [0, \infty)$ $y=-1,\ y \geq 0$

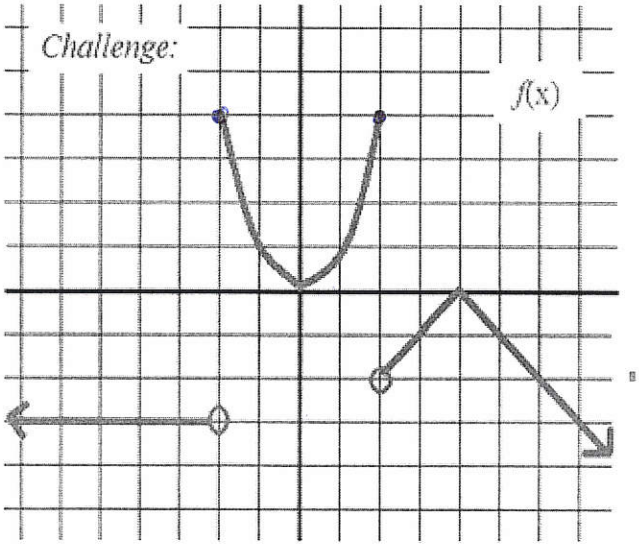
5.



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

Domain $(-\infty, \infty)$ or $\mathbb{R}$ **Range** $(-\infty, \infty)$ or $\mathbb{R}$

6.

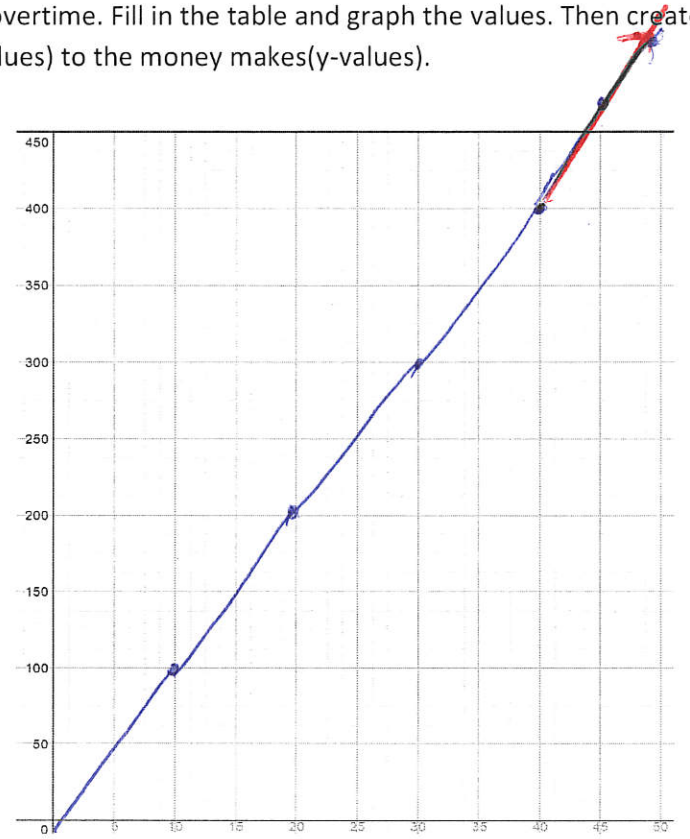


$$f(x) = \begin{cases} -3, & x < -2 \\ x^2, & -2 \leq x \leq 2 \\ -|x-4|, & x > 2 \end{cases}$$

Domain $(-\infty, \infty)$ or $\mathbb{R}$ **Range** $(-\infty, 4]$ or $y \leq 4$

7. Buddy delivers mail to the elves for $10.00 per hour, but he gets overtime for every hour over 40 hours. The overtime is time and a half, so he gets paid $15.00 per hour for overtime. Fill in the table and graph the values. Then create a piecewise function that tracks the hours he works(x-values) to the money makes(y-values).

X(hours)	Y(money)
10	100
20	200
30	300
40	400
50	550
60	700
70	850



$$f(x) = \begin{cases} 10x, & 0 < x \leq 40 \\ 15x - 200, & x > 40 \end{cases}$$

$y - 550 = 15(x - 50)$

$y - 550 = 15x - 750$

$+550 \quad +550$

$y = 15x + 475$