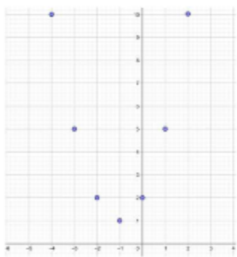


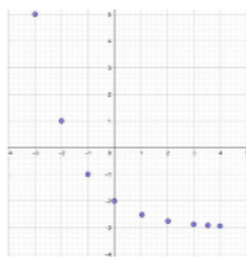
Bell Ringer

Wednesday 10/30

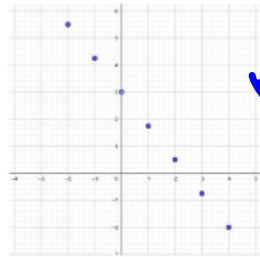
Tell whether the points appear to represent a linear, an exponential, or quadratic function.



Quad



Exp



Linear

$(-4, -4), (-2, -3.4), (0, -3), (2, -2.6), (4, -2)$

None!
 $+2 +2 +2 +2$
 $+0.6$
 $+0.4$
 $+0.4$
 $+0.6$

x	-1	0	1	2	3
y	0.2	1	5	25	125

Exponential!

Correct Finding Key Features ws

* Finding Key Features of Quadratics ws

Name: Key Hr: _____

Find the vertex given an equation in standard form $y = ax^2 + bx + c$ using $\frac{-b}{2a}$.

1. $y = x^2 - 4x + 1$
 $\frac{-(-4)}{2(1)} = \frac{4}{2} = 2$
 $4 - 8 + 1$
 Vertex: $(2, -3)$

2. $y = -5x^2 + 10x + 4$
 $\frac{-10}{2(-5)} = \frac{-10}{-10} = 1$
 $-5 + 10 + 4$
 Vertex: $(1, 9)$

Find the vertex given an equation in vertex form $y = a(x-h)^2 + k$.

3. $y = 3(x-1)^2 + 2$
 Vertex: $(1, 2)$

4. $y = -0.5(x+3)^2$
 Vertex: $(-3, 0)$

5. $y = x^2 - 5$
 Vertex: $(0, -5)$

Find the vertex given an equation in factored form $y = (x-p)(x-q)$ using $\frac{p+q}{2}$.

6. $y = (x-2)(x-6)$
 $\frac{2+6}{2} = 4$
 $x = 2, 6$
 Vertex: $(4, 4)$

7. $y = -2(x+3)(x+7)$
 $x = -3, x = -7$
 $\frac{-3-7}{2} = \frac{-10}{2} = -5$
 Vertex: $(-5, 8)$

8. $y = (x-3)(x+3)$
 $x = +3, x = -3$
 $\frac{3-3}{2} = 0$
 Vertex: $(0, -9)$

Find the vertex.

9. $y = -x^2 + 6x + 8$
 $\frac{-6}{2(-1)} = \frac{-6}{-2} = 3$
 $-9 + 18 + 8$
 Vertex: $(3, 17)$

10. $y = x^2 - 16$
 Vertex: $(0, -16)$

11. $y = (x-5)(x-3)$
 $x = 5, x = 3$
 $\frac{5+3}{2} = 4$
 Vertex: $(4, -1)$

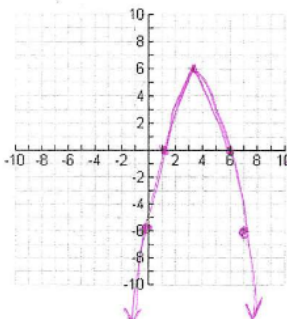
12. $y = (x+4)^2 + 5$
 Vertex: $(-4, 5)$

13. $y = (x+5)(x-3)$
 $x = -5, x = 3$
 $\frac{-5+3}{2} = \frac{-2}{2} = -1$
 Vertex: $(-1, -16)$

14. $y = 2x^2 - 3x + 1$
 $\frac{-(-3)}{2(2)} = \frac{3}{4}$
 $\frac{-3-9}{4} = \frac{-12}{4} = -3$
 Vertex: $(\frac{3}{4}, -\frac{1}{8})$

Given the equations, find the parts and sketch a graph.

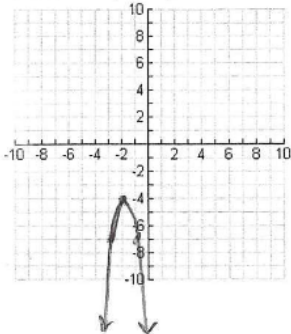
15. $f(x) = -x^2 + 7x - 6$



$\frac{-7}{2(-1)} = \frac{-7}{-2} = 3.5$
 $-(x^2 - 7x + 6)$
 $(x-1)(x-6)$
 $x-1=0 \quad x=1$
 $x-6=0 \quad x=6$

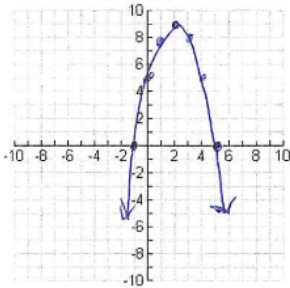
- A) Vertex $(3.5, 6.25)$
- B) Vertex Form $y = -(x-3.5)^2 + 6.25$
- C) Axis of Symmetry $x = 3.5$
- D) Max/Min & its value $\text{max @ } 6.25$
- E) y-intercept $(0, -6)$
- F) x-intercept(s) $(1, 0), (6, 0)$
- G) Domain $(-\infty, \infty)$
- H) Range $(-\infty, 6.25]$
- I) Find $f(-1)$ 0

16. $f(x) = -3(x+2)^2 - 4$



- A) Vertex $(-2, -4)$
- B) Vertex Form $y = -3(x+2)^2 - 4$
- C) Axis of Symmetry $x = -2$
- D) Max/Min & its value Max @ -4
- 😊 E) y-intercept $(0, -16)$
- F) x-intercept(s) none
- G) Domain $(-\infty, \infty)$
- H) Range $(-\infty, -4]$
- I) Find $f(-3)$ -7

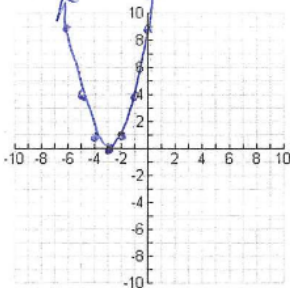
17. $f(x) = -(x+1)(x-5)$



$-(3)(-3)$
 $-(4)(-2) = 8$

- A) Vertex $(2, 9)$
- 😊 B) Vertex Form $y = -(x-2)^2 + 9$
- C) Axis of Symmetry $x = 2$
- D) Max/Min & its value max at 9
- E) y-intercept $(0, 5)$
- F) x-intercept(s) $(-1, 0)$ $(5, 0)$
- G) Domain $(-\infty, \infty)$
- H) Range $(-\infty, 9]$
- I) Find $f(3)$ 8

18. $f(x) = x^2 + 6x + 9$



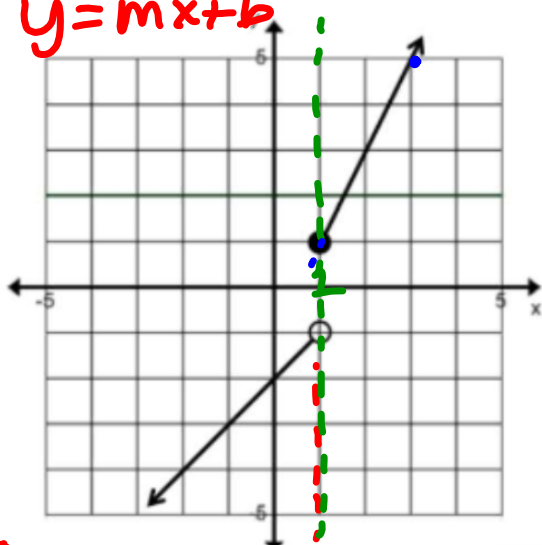
$\frac{-b}{2a} = -3$
 $9 - 18 + 9$

- A) Vertex $(-3, 0)$
- B) Vertex Form $y = (x+3)^2$
- C) Axis of Symmetry $x = -3$
- D) Max/Min & its value min at 0
- E) y-intercept $(0, 9)$
- 😊 F) x-intercept(s) $(-3, 0)$
- G) Domain $(-\infty, \infty)$
- H) Range $[0, \infty)$
- I) Find $f(-5)$ 4

3.7 online hw due tomorrow
All Ch 3 hw due Wed 11/13

1 Write the equation of the piecewise function

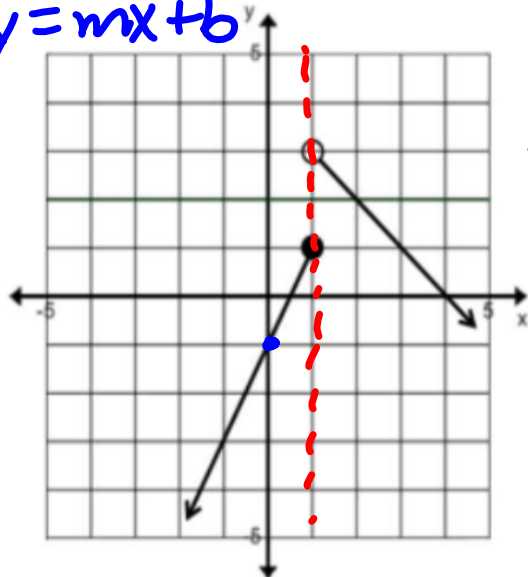
$$y = mx + b$$



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

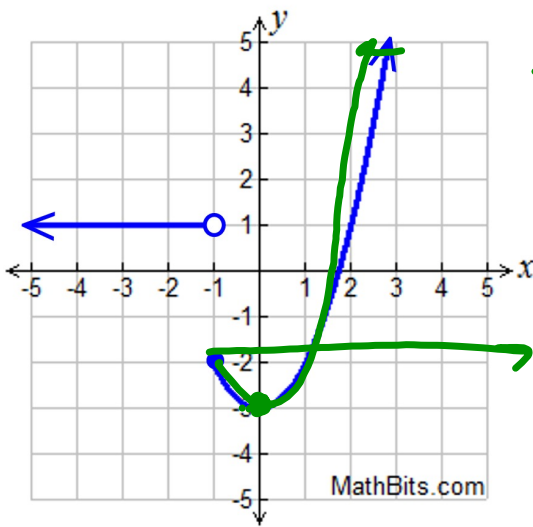
2 Write the equation of the piecewise function

$$y = mx + b$$



$$f(x) \begin{cases} 2x - 1, & x \leq 1 \\ -x + 4, & x > 1 \end{cases}$$

3 Write the equation of the piecewise function



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

$$(x + 0)^2$$

4

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

$$(4, 16) \quad f(-4) = (-4)^2 = 16$$

$$(0, 0) \quad f(0) = 0$$

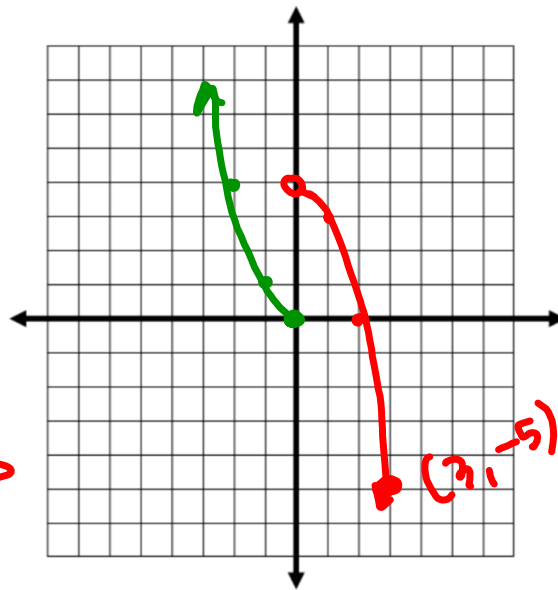
$$(3, -5) \quad f(3) = -5 \\ -(3)^2 + 4 \\ -9 + 4 = -5$$

Domain:

$$(-\infty, \infty)$$

Range:

$$(-\infty, \infty)$$



5

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

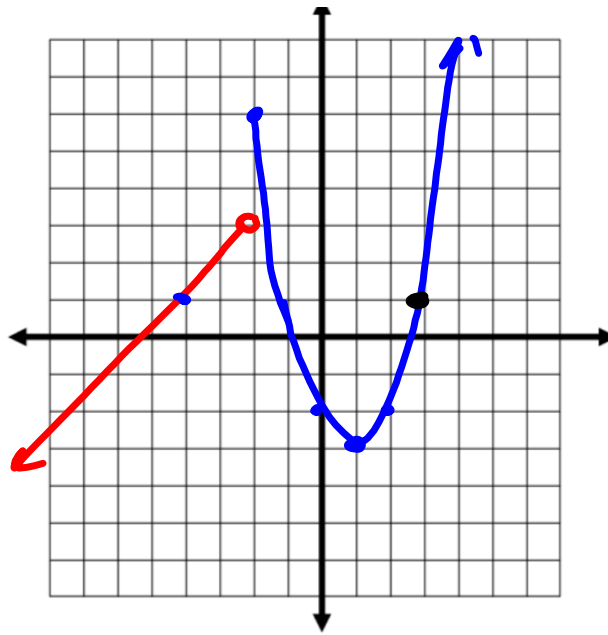
$$(3,1) \quad f(3) = 1$$

$$(-4,1) \quad f(-4) = 1$$

$$(-2,6) \quad f(-2) = 6$$

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

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



due Friday

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

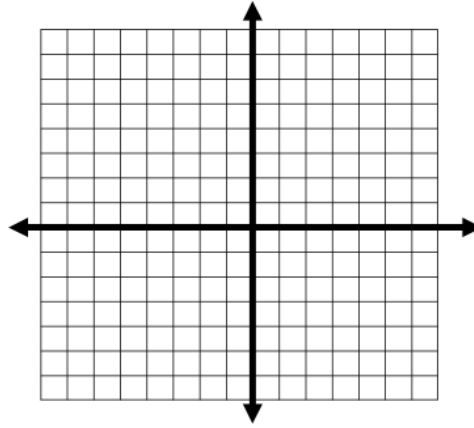
Domain: _____

Range: _____

$f(-2) =$ _____

$f(6) =$ _____

$f(1) =$ _____



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

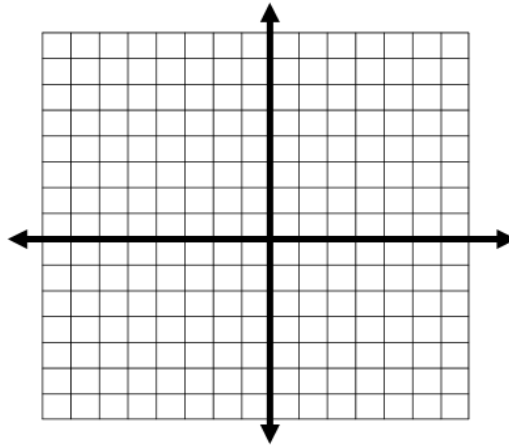
Domain: _____

Range: _____

$f(-2) =$ _____

$f(0) =$ _____

$f(5) =$ _____



3.

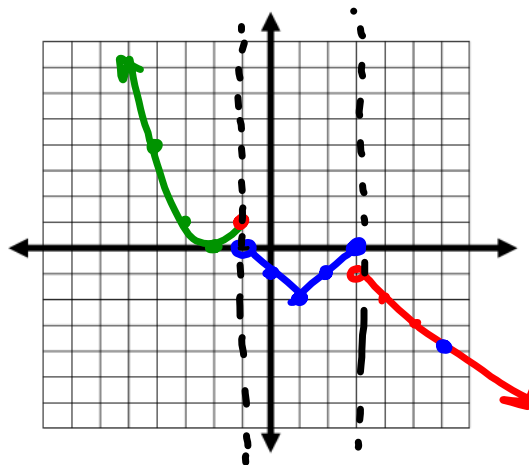
$f(x) = \begin{cases} (x+2)^2 & x \leq -1 \\ |x-1| - 2 & -1 < x \leq 3 \\ -x + 2 & x > 3 \end{cases}$

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

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

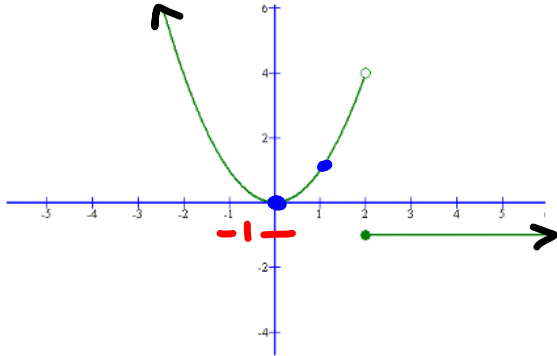
$f(-1) = 1$

$f(6) = -4$



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

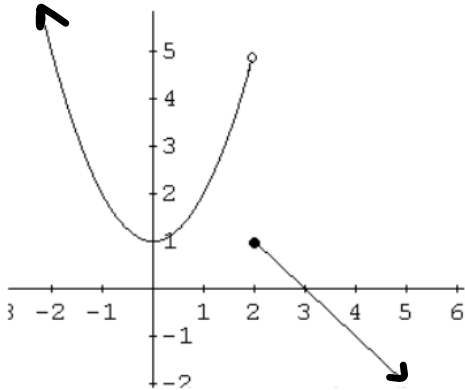
4.



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

Domain $(-\infty, \infty)$ Range $[-1] \cup [0, \infty)$
 $[-1]$ and $[0, \infty)$
 $[0, \infty)$

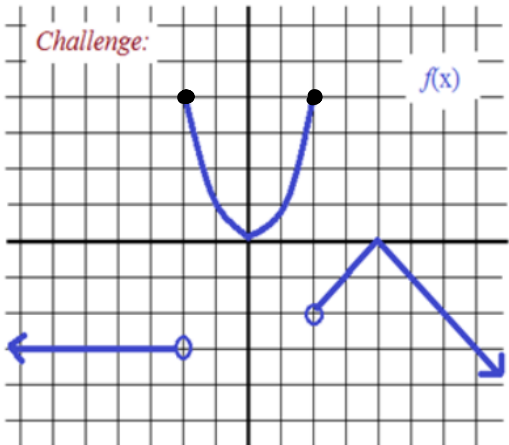
5.



$$f(x) = \begin{cases} \end{cases}$$

Domain _____ Range _____

6.

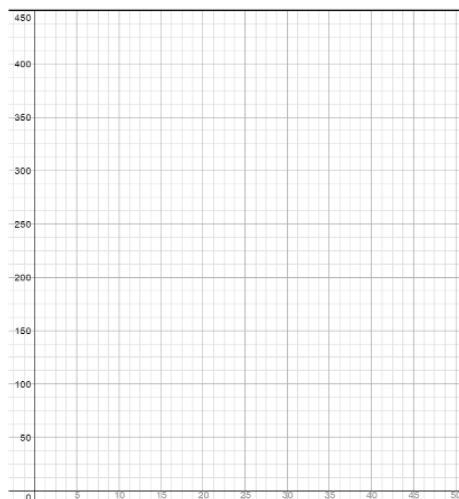


$$f(x) = \begin{cases} \end{cases}$$

Domain _____ Range _____

7. Buddy delivers mail to the elves for \$10.00 per hour, but he get 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	
20	
30	
40	
50	
60	
70	



$$f(x) = \{$$

