

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

Vertex: $(-3, 0)$

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

R: $[0, \infty)$

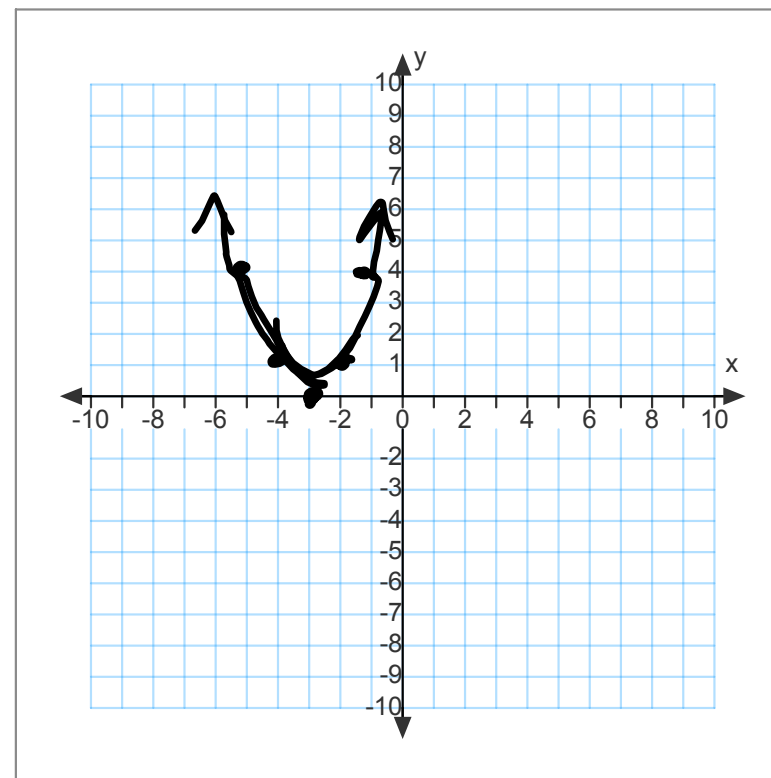
Max or Min: 0

x-intercept: $(-3, 0)$

y-intercept: $(0, 9)$

x	y
-2	1
-1	4

→ $y = (x + 3)^2$
 $y = (0 + 3)^2 = 9$



$$f(x) = -x^2 + 4$$

Vertex: (0, 4)

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

R: $(-\infty, 4]$

Max or Min: 4

x-intercept: $(-2, 0)$ $(2, 0)$

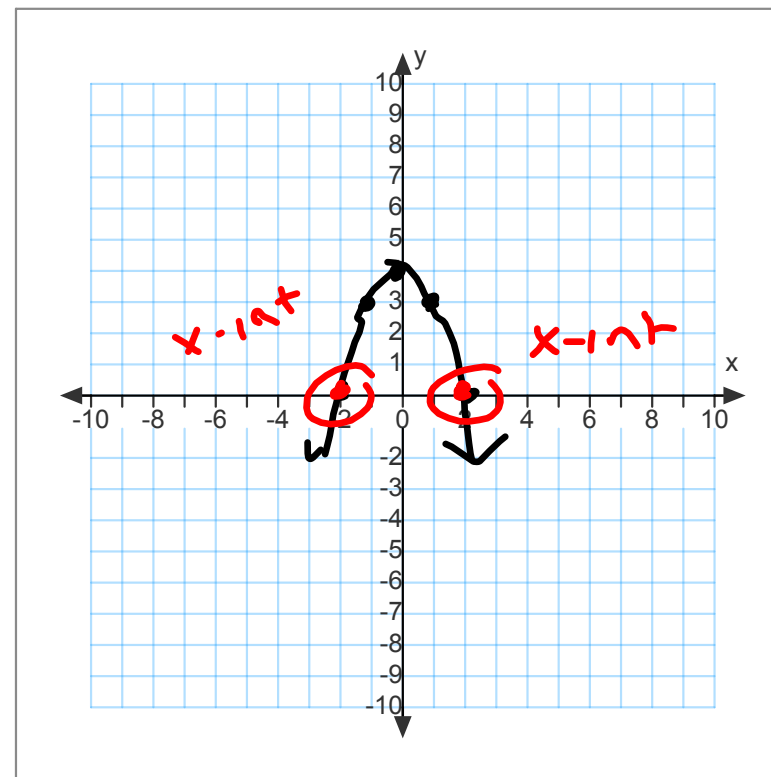
y-intercept: $(0, 4)$

x	y
1	3
2	0



$$f(x) = -x^2 + 4$$

$$y = -(0)^2 + 4 = 4$$



$$f(x) = x^2 + 4x + 7$$

Vertex: $(-2, 3)$

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

R: $[3, \infty)$

Max or Min: 3

x-intercept: none

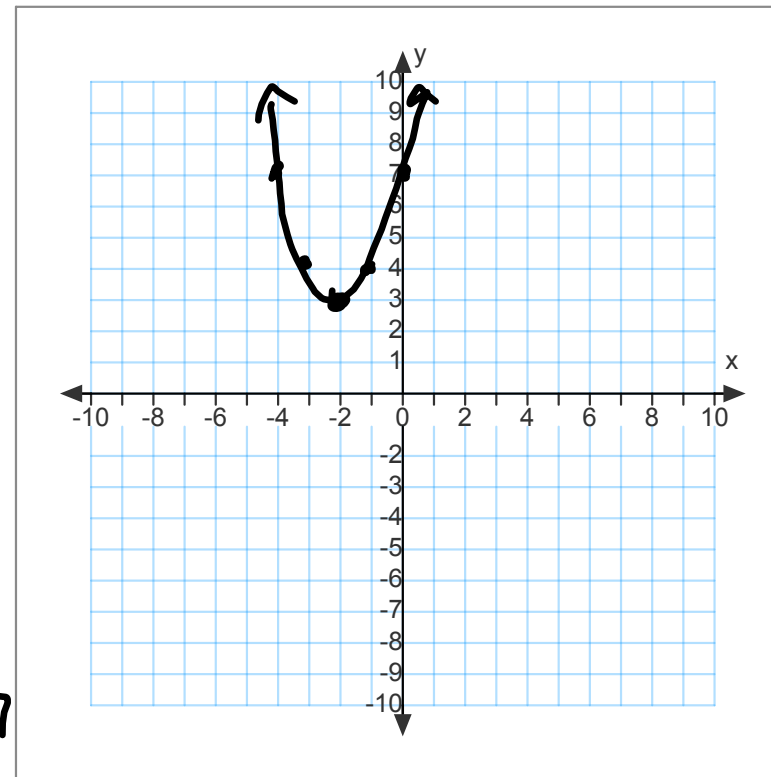
y-intercept: $(0, 7)$

x	y
-1	4
0	7

$$h = -\frac{b}{2a} = -\frac{4}{2(1)} = -\frac{4}{2} = -2$$

$$k = (-2)^2 + 4(-2) + 7 = 3$$

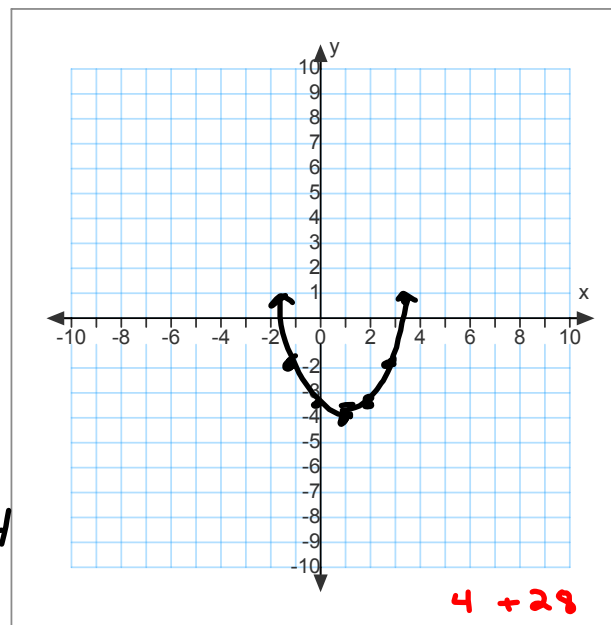
$$y\text{-int: } y = (0)^2 + 4(0) + 7 = 7$$



$$f(x) = \frac{1}{2}x^2 - x - \frac{7}{2}$$

Vertex: $(1, -4)$
 D: $(-\infty, \infty)$
 R: $[-4, \infty)$
 Max or Min: -4
 x-intercept: $(1 \pm 2\sqrt{2}, 0)$
 y-intercept: $(0, -\frac{7}{2})$

x	y
0	$-\frac{7}{2}$
-1	-2



$$h = \frac{-b}{2a} = \frac{-(-1)}{2(\frac{1}{2})} = \frac{1}{1} = 1$$

$$k = \frac{1}{2}(1)^2 - 1 - \frac{7}{2} = \frac{1}{2} - 1 - \frac{7}{2} = -4$$

x-int :

$$y = \frac{1}{2}x^2 - x - \frac{7}{2}$$

$$0 = \frac{1}{2}x^2 - x - \frac{7}{2}$$

$$0 = x^2 - 2x - 7$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-7)}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{32}}{2}$$

$$x = \frac{2 \pm 4\sqrt{2}}{2}$$

$$x = \frac{2}{2} \pm \frac{4\sqrt{2}}{2}$$

$$x = 1 \pm 2\sqrt{2}$$

Write an equation of each quadratic in the form $f(x) = a(x - h)^2 + k$.

Vertex: $(-5, -3)$

Point: $(-2, 6)$

$$f(x) = 1(x - (-5))^2 + -3$$

$$f(x) = (x + 5)^2 - 3$$

$$y = a(x - h)^2 + k$$

$$6 = a(-2 - (-5))^2 + -3$$

$$6 = a(-2 + 5)^2 - 3$$

$$9 = a(3)^2$$

$$9 = 9a$$

$$a = 1$$

Write an equation of each quadratic in the form $f(x) = a(x - h)^2 + k$.

$\overset{h, k}{\text{Vertex: } (5, 1)}$
 $\underset{x, y}{\text{Point: } (1, -7)}$

$$f(x) = -\frac{1}{2}(x - 5)^2 + 1$$

$$y = a(x - h)^2 + k$$

$$-7 = a(1 - 5)^2 + 1$$

$$-7 = a(-4)^2 + 1$$

$$\frac{-8}{16} = \frac{a(16)}{16}$$

$$a = -\frac{1}{2}$$