

Standard Form: $y = ax^2 + bx + c$

Vertex: $x = \frac{-b}{2a}$

← also the Axis of Symmetry

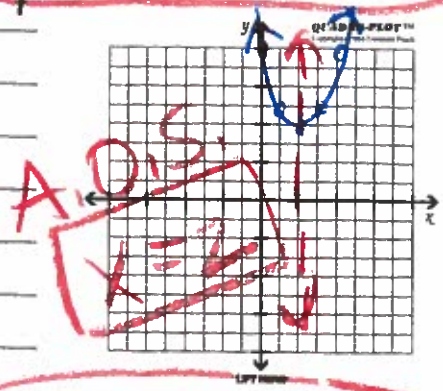
Vertex Form: $y = a(x-h)^2 + k$

5.1-5.4 QUIZ Review

① Graph $y = x^2 - 4x + 8$

$a=1, b=-4, c=8$

| x | y |
|---|---|
| 0 | 8 |
| 1 | 5 |
| 2 | 4 |
| 3 | 5 |
| 4 | 8 |



Draw and Label the axis of symmetry.

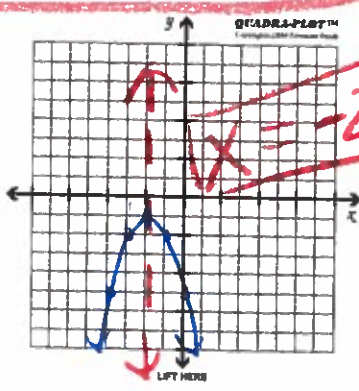
$x = \frac{+(-4)}{2(1)} = \frac{-4}{2} = -2$

② Graph $y = -(x+2)^2 - 1$

$(-2, -1)$

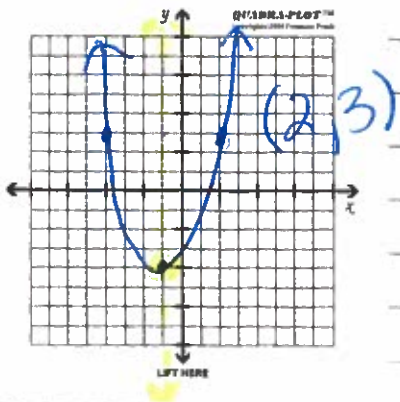
Vertex Form

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



Draw and Label the axis of symmetry.

③ Graph the parabola with vertex $(-1, -4)$ and a point at $(-4, 3)$. Label the new point



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

Find vertex

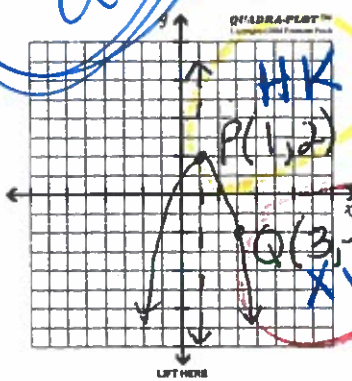
$$a = -3$$

$$x = \frac{-b}{2a}$$

Find a

(4) Write the equation of the parabola in vertex form.

(5) Write the equation in vertex form.



$$-2 = a(3-1)^2 + 2$$

$$-2 = 4a + 2$$

$$\frac{-4}{4} = \frac{4a}{4}$$

$$-1 = a$$

$$y = -1(x-3)^2 - 2$$

$$y = -3x^2 - 6x - 8$$

$$b = -6$$

$$x = \frac{-(-6)}{2(-3)} = \frac{6}{-6} = -1$$

$$y = -3(-1)^2 - 6(-1) - 8 = -5$$

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

(6) Identify the vertex and y-intercept

$$y = -(x-4)^2 - 25 \quad (4, -25) \quad -41$$

(7) The equation for the motion of a projectile fired straight up at an initial velocity of 64 ft/s is $h = 64t - 16t^2$, h is the height in feet and t is time in seconds.

Vertex Formula

$$a = -16 \quad b = 64$$

a) how long does it take to reach maximum height?

$t = 2$ seconds

$$y = -16x^2 + 64x$$

$$x = \frac{-b}{2a} = \frac{-64}{2(-16)}$$

b) what is the maximum height?

$$h = -16(2)^2 + 64(2) = 64 \text{ Ft}$$

(8) Factor

$$2x^2 + 5x = 2x(2x + 5)$$

binomial

a) $4x^3 + 10x$

b) $x^2 - 14x - 15 = (x+1)(x-15)$

binomial

c) $36x^2 - 49 = (6x+7)(6x-7)$ Diff. Squares

d) $x^2 - 13x + 42 = (x-6)(x-7)$

e) $3x^2 - 14x + 8$

$$\begin{array}{l} 3x^2 - 12x - 2x + 8 \\ (3 \cdot x \cdot x - 3 \cdot 4 \cdot x) \quad (-2 \cdot x + (-2) \cdot -4) \end{array}$$

$$3x(x-4) - 2(x-4)$$

$$\begin{array}{r|l} 24 & \\ -1 & -24 \\ \hline -2 & -12 \\ -3 & -8 \\ -4 & -6 \end{array}$$