

Complete the square to put the quadratic equation in vertex form. Then find the vertex, y-intercept and intercepts. Use these ordered pairs to graph the parabola.

1.  $y = x^2 - 4x - 6$

Vertex:  $(2, -10)$

X-Intercepts:  $5.16$  and  $-1.16$

y-intercept:  $-6$

$$y + 6 = x^2 - 4x$$

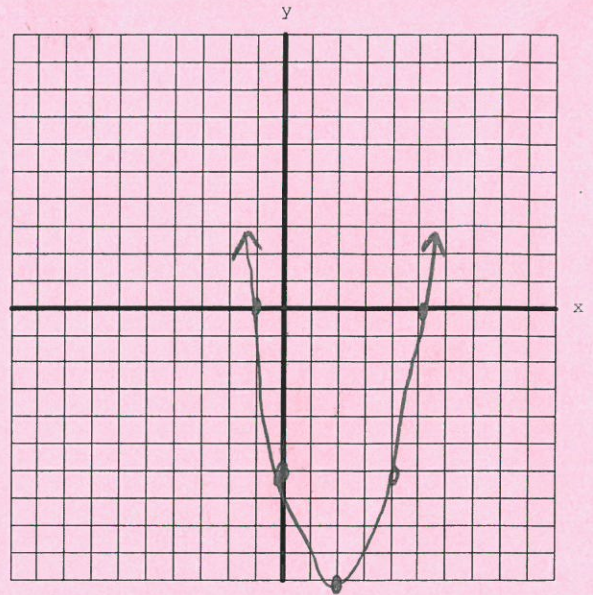
$$y + 6 + 4 = x^2 - 4x + 4$$

$$y + 10 = (x - 2)^2$$

$$y = (x - 2)^2 - 10$$

$$\pm\sqrt{10} = x - 2$$

$$x = 2 \pm \sqrt{10}$$



2.  $y = x^2 - 10x + 23$

Vertex:  $(5, -2)$

X-Intercepts:  $6.41$  and  $3.59$

Y-intercept:  $23$

$$y - 23 = x^2 - 10x$$

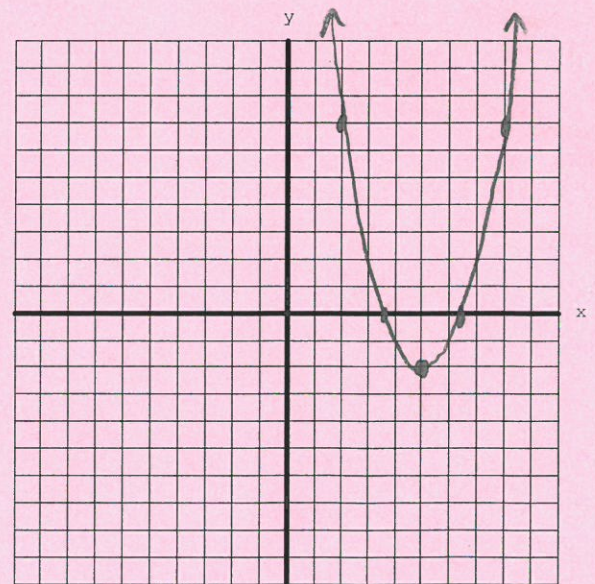
$$y - 23 + 25 = x^2 - 10x + 25$$

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

$$y = (x - 5)^2 - 2$$

$$\pm\sqrt{2} = x - 5$$

$$x = 5 \pm \sqrt{2}$$



$$y = 2^2 - 10(2) + 23$$

$$y = 4 - 20 + 23 = 7$$

Use the equation in vertex form to find the vertex, y-intercept, and x-intercepts. Use these ordered pairs to graph the parabola.

3.  $y = (x + 1)^2 - 10$

Vertex:  $(-1, -10)$

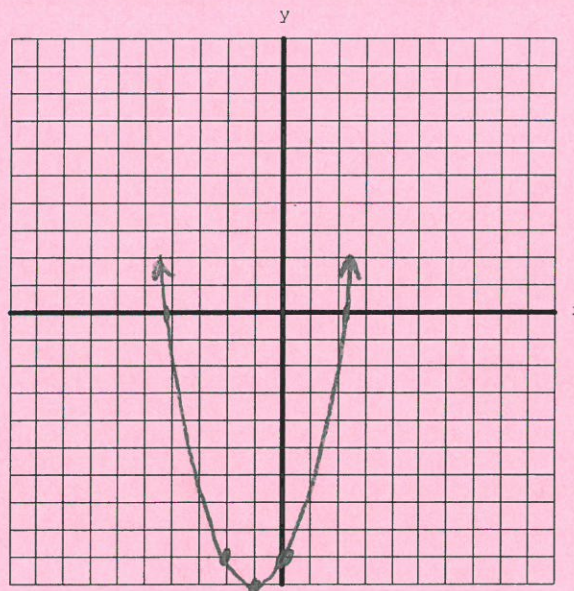
X-Intercepts:  $2.16$  and  $-4.16$

Y-intercept:  $-9$

$$10 = (x+1)^2$$

$$\pm \sqrt{10} = x+1$$

$$x = -1 \pm \sqrt{10}$$



4.  $y = (x + 6)^2 - 5$

Vertex:  $(-6, -5)$

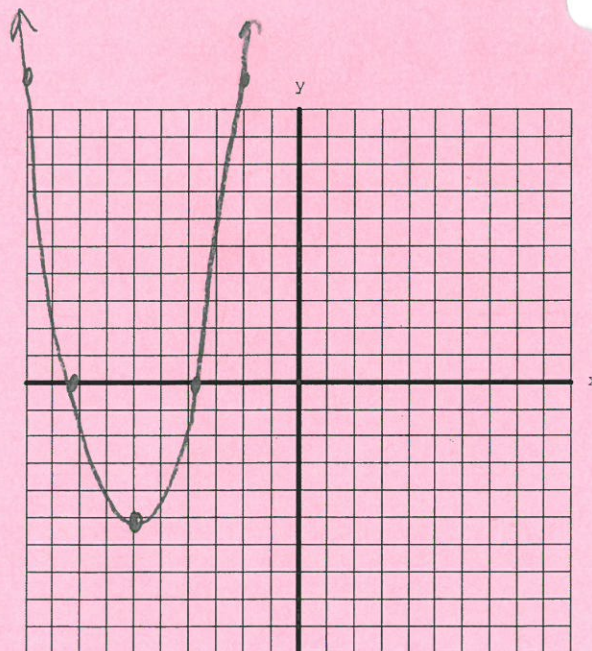
X-Intercepts:  $-3.76$  and  $-8.24$

y-intercept:  $31$

$$5 = (x+6)^2$$

$$\pm \sqrt{5} = x+6$$

$$x = -6 \pm \sqrt{5}$$



$$y = (-2+6)^2 - 5$$

$$y = 4^2 - 5$$

$$y = 11$$