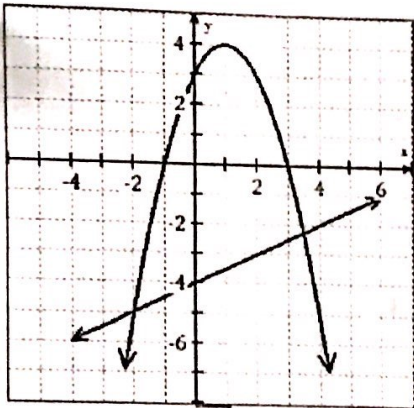
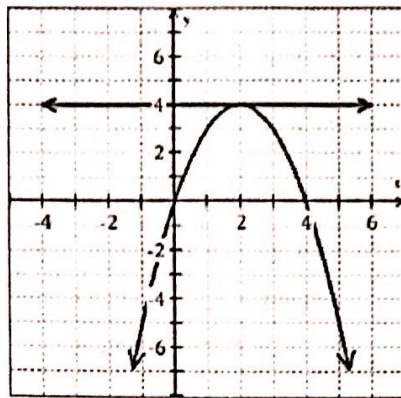


4.9 Quadratic Systems

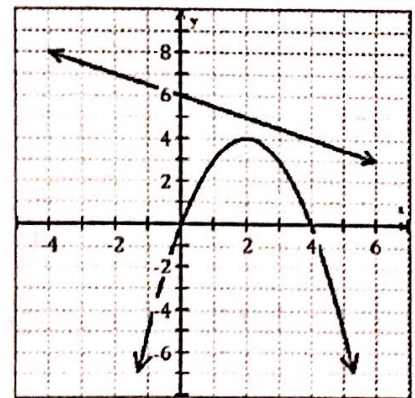
Possible Solutions for One Quadratic Equation and one Linear Equation



2 solutions



1 solution



no solutions

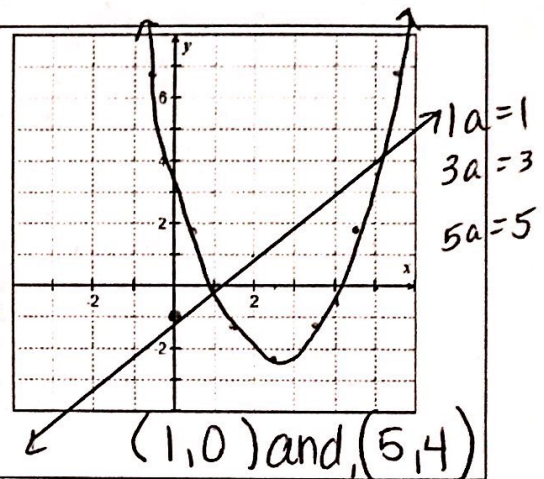
Solve the following system by graphing:

$$\begin{cases} y = x^2 - 5x + 4 \\ y = x - 1 \end{cases}$$

$$\frac{5}{2(1)} = \frac{5}{2}$$

$$\left(\frac{5}{2}\right)^2 - 5\left(\frac{5}{2}\right) + 4$$

$$\frac{25}{4} - \frac{50}{4} + \frac{16}{4} = \frac{-9}{4}$$



(1, 0) and (5, 4)

Solve by substitution:

$$\begin{cases} y = -x^2 - 3x + 10 \\ y = x + 5 \end{cases}$$

$$x + 5 = -x^2 - 3x + 10$$

$$x^2 + 4x - 5 = 0$$

$$(x + 5)(x - 1) = 0$$

$$x = -5, 1$$

$$y = -5 + 5 \quad y = 1 + 5$$

$$\boxed{(-5, 0) \quad (1, 6)}$$

Solve by substitution:

$$\begin{cases} y = x^2 - 4x + 5 \\ y = -x^2 + 5 \end{cases}$$

$$x^2 - 4x + 5 = -x^2 + 5$$

$$2x^2 - 4x = 0$$

$$2x(x - 2) = 0$$

$$x = 0, 2$$

$$y = -0^2 + 5 \quad y = -(2)^2 + 5$$

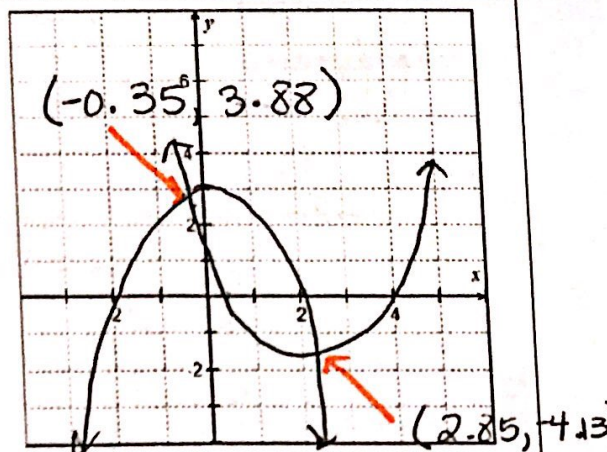
$$\boxed{(0, 5) \quad (2, 1)}$$

Solve using the **INTERSECT** feature on a graphing calculator. Round your answer to the nearest hundredth. Sketch the graph below.

$$\begin{cases} y = x^2 - 5x + 2 \\ y = -x^2 + 4 \end{cases}$$

- type equations into $y=$
- hit graph
- 2nd \rightarrow trace \rightarrow 5: intersect (calc)

Select curve 1, curve 2, and place cursor on a guess for the intersection.



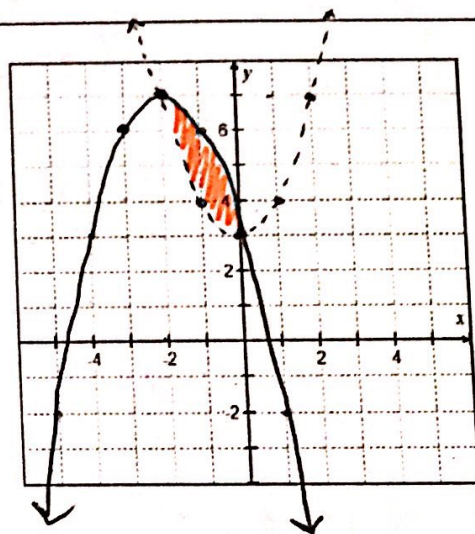
Solving systems of inequalities:

Find the solution of the system of inequalities

$$\begin{cases} 1) y \leq -x^2 - 4x + 3 \rightarrow \text{solid line, shaded below} \\ 2) y > x^2 + 3 \rightarrow \text{dotted line, shaded above} \end{cases}$$

$$\begin{aligned} 1) \frac{4}{2(-1)} = -2 & \quad -(-2)^2 - 4(-2) + 3 & \quad (-2, 7) \\ & \quad -4 + 8 + 3 = 7 \end{aligned}$$

$$2) \frac{0}{2(1)} = 0 \quad 0^2 + 3 = 3 \quad (0, 3) \quad 1, 3, 5$$



Solve by substitution:

$$\begin{cases} y - 2x = x + 5 & y = 3x + 5 \\ y + 1 = x^2 + 5x + 3 & y = x^2 + 5x + 2 \end{cases}$$

$$x^2 + 5x + 2 = 3x + 5$$

$$x^2 + 2x - 3 = 0$$

$$(x + 3)(x - 1) = 0$$

$$x = -3, 1$$

$$y = -3(3) + 5 = -9 + 5 = -4$$

$$y = 3(1) + 5 = 8$$

$$\boxed{(-3, -4) \quad (1, 8)}$$