

Sec. 4.9 Quadratic Systems

Problem 1:

Solve the system

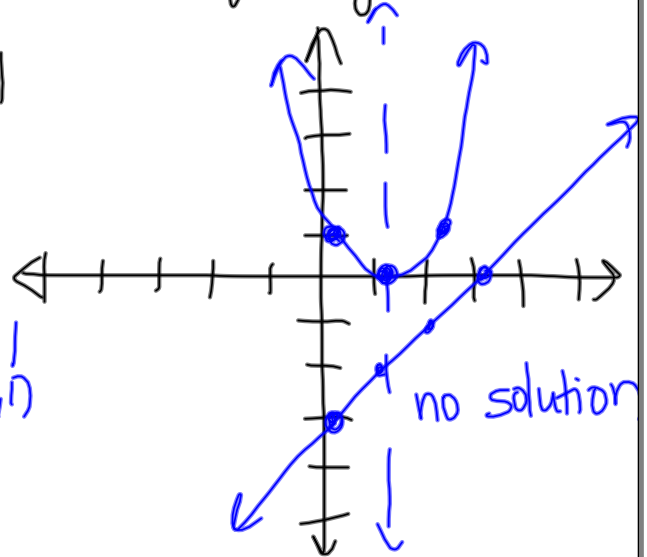
a.
$$\begin{cases} y = x^2 - 2x + 1 \\ y = |x - 3| \end{cases}$$

$$y = x^2 - 2x + 1$$

$$y = (x^2 - 2x + 1) + 1 \quad y\text{-int: } 1 \quad (0,1)$$

$$y = (x-1)^2 \quad v: (1,0)$$

Graphing



b.
$$\begin{cases} y = x^2 + 3x + 9 \\ y = -3x + 4 \end{cases}$$

Use substitution

$$\begin{array}{r} -3x + 4 = x^2 + 3x + 9 \\ +3x - 4 \quad \quad +3x - 4 \\ \hline \end{array}$$

$$0 = x^2 + 6x + 5$$

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

$$x+1=0 \quad x+5=0$$

$$x=-1 \quad x=-5$$

$$(-1, 7) \quad (-5, 19)$$

$$y = -3x + 4$$

$$x = -1$$

$$y = -3(-1) + 4$$

$$y = 3 + 4 = 7$$

$$x = -5$$

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

$$y = 15 + 4$$

$$y = 19$$

c. $\begin{cases} y = x^2 + 9x + 7 \\ -y = +x^2 + -3x + -7 \end{cases}$ Use elimination

$$0 = 2x^2 + 6x$$

$$0 = 2x(x+3)$$

$$2x = 0 \quad x+3 = 0$$

$$x = 0 \quad x = -3$$

$$(0, 7) \quad (-3, -11)$$

$$y = 0^2 + 9(0) + 7$$

$$y = 7$$

$$y = (-3)^2 + 9(-3) + 7$$

$$y = 9 - 27 + 7$$

$$y = -18 + 7$$

$$y = -11$$