

Systems of Linear and Quadratic Equations

What are the solutions of the system?

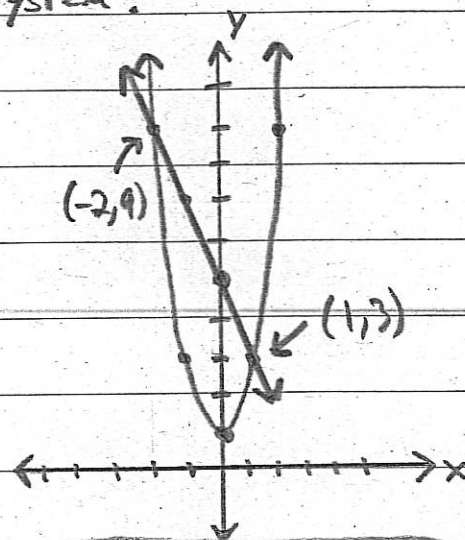
① Solve by graphing.

$$y = 2x^2 + 1 \quad x = \frac{-b}{2a}$$

$$y = -2x + 5 \quad x = \frac{0}{2(2)}$$

$$x = 0$$

x	y
0	1
-1	3
1	3
-2	9
2	9



Solution: $(-2, 9)$ and $(1, 3)$

② Solve by substitution.

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

$$y = -2x + 5$$

$$2x^2 + 1 = -2x + 5$$

$$\begin{array}{r} 2x^2 + 1 = -2x + 5 \\ +2x \quad +2x \\ \hline 2x^2 + 2x + 1 = 5 \\ -5 \quad -5 \\ \hline 2x^2 + 2x - 4 = 0 \end{array}$$

$$\frac{2x^2 + 2x - 4}{2} = 0$$

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

$$(x + 2)(x - 1) = 0$$

$$x = -2, x = 1$$

$$y = -2x + 5$$

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

$$y = 4 + 5$$

$$y = 9 \quad (-2, 9)$$

$$y = -2x + 5$$

$$y = -2(1) + 5$$

$$y = -2 + 5$$

$$y = 3 \quad (1, 3)$$

Solution:
 $(-2, 9), (1, 3)$

③ Solve by elimination.

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

$$y = -2x + 5$$

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

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

$$\frac{0}{-2} = \frac{-2x^2 - 2x + 4}{-2}$$

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

$$0 = (x + 2)(x - 1)$$

$$x = -2, x = 1$$

$$y = -2x + 5$$

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

$$y = 9 \quad (-2, 9)$$

$$y = -2x + 5$$

$$y = -2(1) + 5$$

$$y = 3 \quad (1, 3)$$

Solution:
 $(-2, 9), (1, 3)$