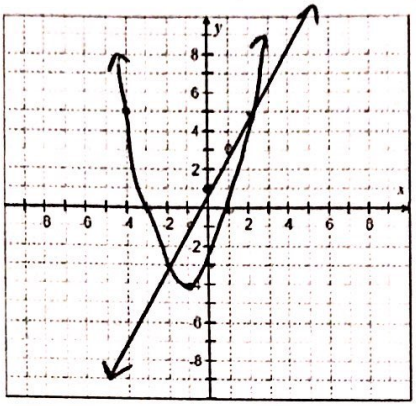
Name: _____ Algebra 2

Date: _____ Period: _____ Quadratic Systems

4.9 Practice

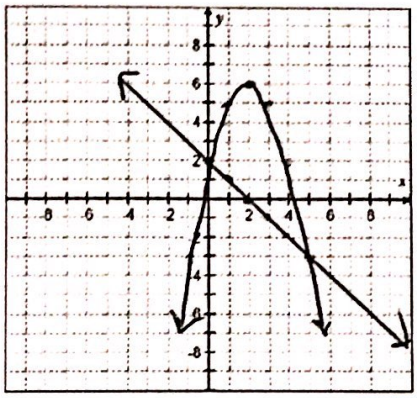
Problems 1-4, solve each system by graphing.

1. $\begin{cases} y = x^2 + 2x - 3 \\ y = 2x + 1 \end{cases}$ $\frac{-2}{2(1)} = -1$ $(-1)^2 + 2(-1) - 3$ $1 - 2 - 3 = -4$



(2, 5)
(-2, -3)

2. $\begin{cases} y = -x^2 + 4x + 2 \\ y = -x + 2 \end{cases}$ $\frac{-4}{2(-1)} = 2$ $-(2)^2 + 4(2) + 2$ $-4 + 8 + 2 = 6$



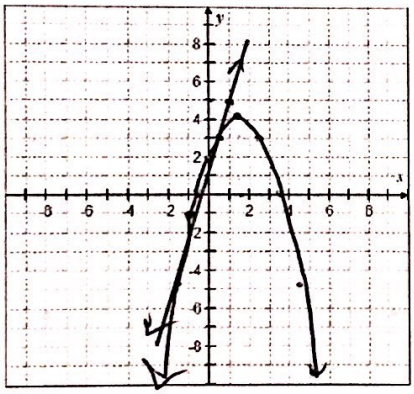
(0, 2)
(5, -3)

3. $\begin{cases} y = -x^2 + 3x + 2 \\ y = 3x + 2 \end{cases}$ $\frac{-3}{2(-1)} = \frac{3}{2}$

$-\left(\frac{3}{2}\right)^2 + 3\left(\frac{3}{2}\right) + 2$

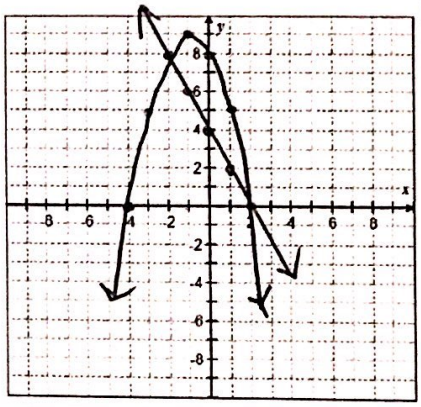
$-\frac{9}{4} + \frac{9}{2} + 2$

$-\frac{9}{4} + \frac{18}{4} + \frac{8}{4} = \frac{17}{4}$



(0, 2)
(-1, -1)

4. $\begin{cases} y = -x^2 - 2x + 8 \\ y = -2x + 4 \end{cases}$ $\frac{2}{2(-1)} = -1$ $-(-1)^2 - 2(-1) + 8$ $-1 + 2 + 8 = 9$



(2, 8)
(2, 0)

Problems 5-10, solve each system by substitution.

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

$x^2 - 2x - 2 = -3x + 4$

$x^2 + x - 6 = 0$

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

$x = -3, 2$

$y = -3(-3) + 4 = 13$ $y = -3(2) + 4$

(-3, 13) (2, -2)

6. $\begin{cases} y = x^2 + 5x \\ x + y = 7 \end{cases}$ $y = -x + 7$

$x^2 + 5x = -x + 7$

$x^2 + 6x - 7 = 0$

$(x + 7)(x - 1) = 0$

$x = -7, 1$

$y = 7 + 7$ $y = -1 + 7$

(-7, 14) (1, 6)

7. $\begin{cases} y = 2x^2 - 5x + 6 \\ y = 3x - 2 \end{cases}$

$2x^2 - 5x + 6 = 3x - 2$

$2x^2 - 8x + 8 = 0$

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

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

$x = 2$

$3(2) - 2 = 6 - 2 = 4$

$(2, 4)$

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

$3x^2 + 2x - 1 = -x + 5$

$3x^2 + 3x - 6 = 0$

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

$3(x+2)(x-1) = 0$

$x = -2, 1$

$2 + 5$

$(-2, 7)(1, 4)$

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

$x^2 - 3x - 4 = -x^2 + x + 2$

$2x^2 - 4x - 6 = 0$

$2(x^2 - 2x - 3) = 0$

$2(x-3)(x+1) = 0$

$x = 3, -1$

$y = 3^2 - 3(3) - 4$

$9 - 9 - 4$

$y = (-1)^2 - 3(-1) - 4$

$1 + 3 - 4$

$(3, -4)(-1, 0)$

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

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

$3x^2 + 3x = 0$

$3x(x+1) = 0$

$x = 0, -1$

$y = 0 + 0 - 5$

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

$2 - 1 - 5$

$(0, -5)$ $(-1, -4)$

Problems 11-12, solve each system by graphing.

11. $\begin{cases} y > x^2 - 4x \\ y \leq 3 - x^2 \end{cases}$ ① → dotted, shade above; ② → solid, shade below

$y \leq -x^2 + 3$

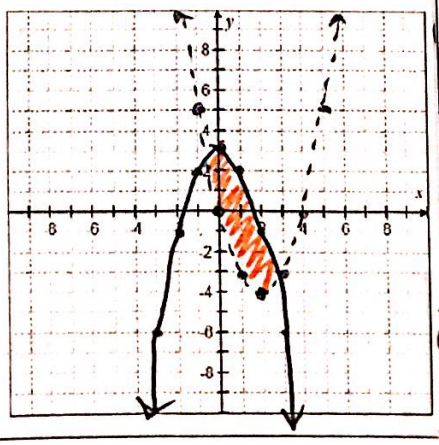
① $\frac{4}{2(1)} = 2$ $(2, -4)$

$2^2 = 4(2)$

$4 - 8 = -4$

② $\frac{0}{2(-1)} = 0$

$0, 3$



12. $\begin{cases} y \geq x^2 - 6x + 5 \\ y \leq 6 + x - x^2 \end{cases}$

$-x^2 + x + 6$

$\frac{-1}{2(-1)} = \frac{1}{2}$ $\frac{1}{2}(1) = 3$ $9 - 18 + 5$ $-9 + 5 = -4$

$-\left(\frac{1}{2}\right)^2 + \frac{1}{2} + 6$

$-\frac{1}{4} + \frac{2}{4} + \frac{24}{4} = \frac{25}{4}$