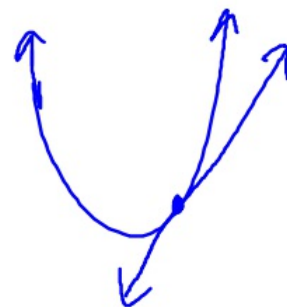Solving Systems of Quadratic and Linear Equations   Name:

Notes and Assignment

label

$(-2,4)$ $(2,4)$

$(-2,4.8)$ $(2,4.8)$

NO
Solutions
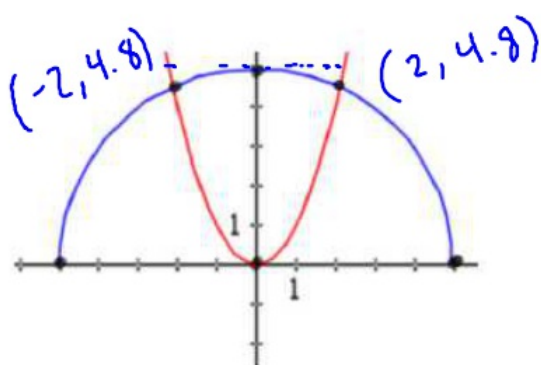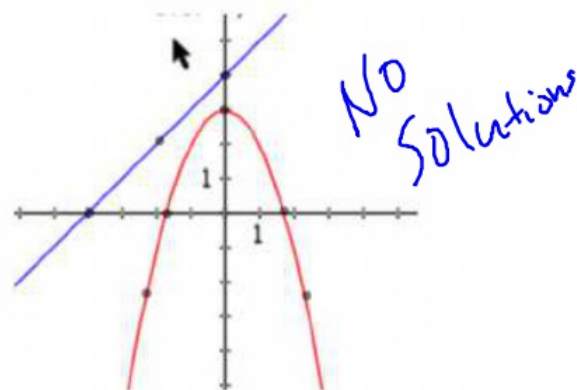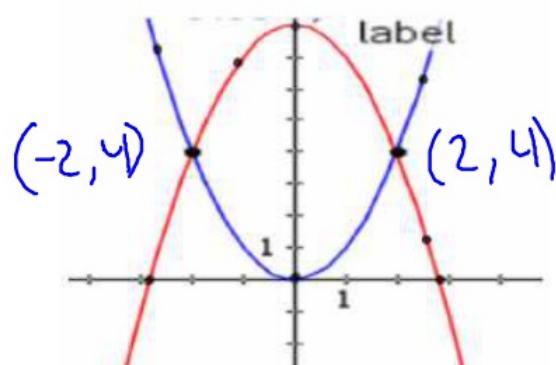
Use Substitution

Solve each system of equations algebraically.

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

$-x^2 + 1 = -2x + 2$
$+x^2 \qquad\quad +x^2$
$1 = x^2 - 2x + 2$
$-1 \qquad\qquad -1$
$0 = x^2 - 2x + 1$
$0 = (x-1)(x-1)$
$0 = x - 1$
$1 = x$

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

$\boxed{(1, 0)}$

2) $x^2 + y = 5$
   $\dfrac{-y = x - 3}{-1} \Rightarrow y = \boxed{-x + 3}$

$x^2 + (-x + 3) = 5$
$x^2 - x + 3 = 5$
$\qquad\quad -5 \; -5$
$x^2 - x - 2 = 0$
$(x-2)(x+1) = 0$
$x - 2 = 0 \qquad x + 1 = 0$
$x = 2 \qquad\quad x = -1$
$y = -2 + 3 \qquad y = 1 + 3$
$y = 1 \qquad\qquad y = 4$
$\boxed{(2, 1)} \qquad \boxed{(-1, 4)}$

3) $y = 27 - x^2$
   $y = 2x^2$

$27 - x^2 = 2x^2$
$\underline{\; -2x^2 \quad -2x^2}$
$27 - 3x^2 = 0$
$-3x^2 + 27 = 0$
$\underline{\qquad -27 \; -27}$
$\dfrac{-3x^2}{-3} = \dfrac{-27}{-3}$
$\sqrt{x^2} = \sqrt{9}$
$x = \pm 3$

$y = 2(3)^2$
$y = 2(9)$
$y = 18$
$\boxed{(3, 18)}$

$y = 2(-3)^2$
$y = 2(9)$
$y = 18$
$\boxed{(-3, 18)}$

4)
$y = x^2 + 4x - 2$
$y = 6x - 3$

6)

$$y = -x^2 + 9$$
$$y = x^2 + 1$$

7)

$$y = x^2$$
$$3x = y + 2$$

8)

$$x^2 - y = 3$$
$$2x - y = 3$$

9) Find the solution for the given system