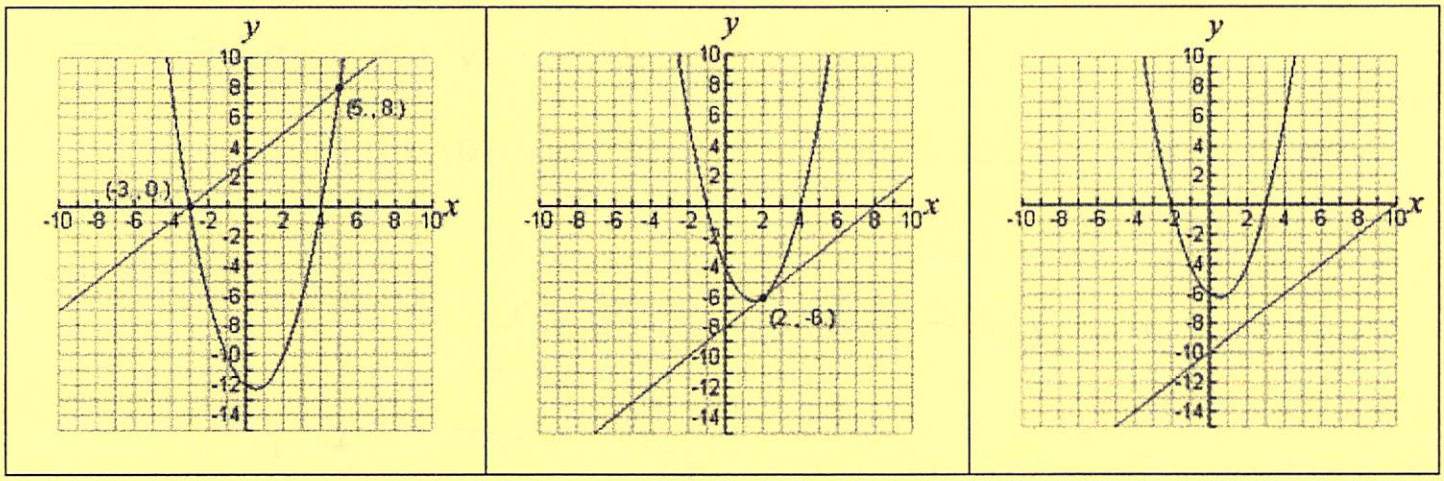
Systems of Linear and Quadratic Equations

Remember when we talk about solving a system of equations we are talking about finding the coordinates or points that the functions have in common. We will need to solve systems of linear and quadratic equations both **graphically** and **algebraically**.

How many solutions or points in common do the following systems have?



Examples:

1. Solve the following system of quadratic-linear equations **graphically**.

$y = x^2 - 4x - 2$

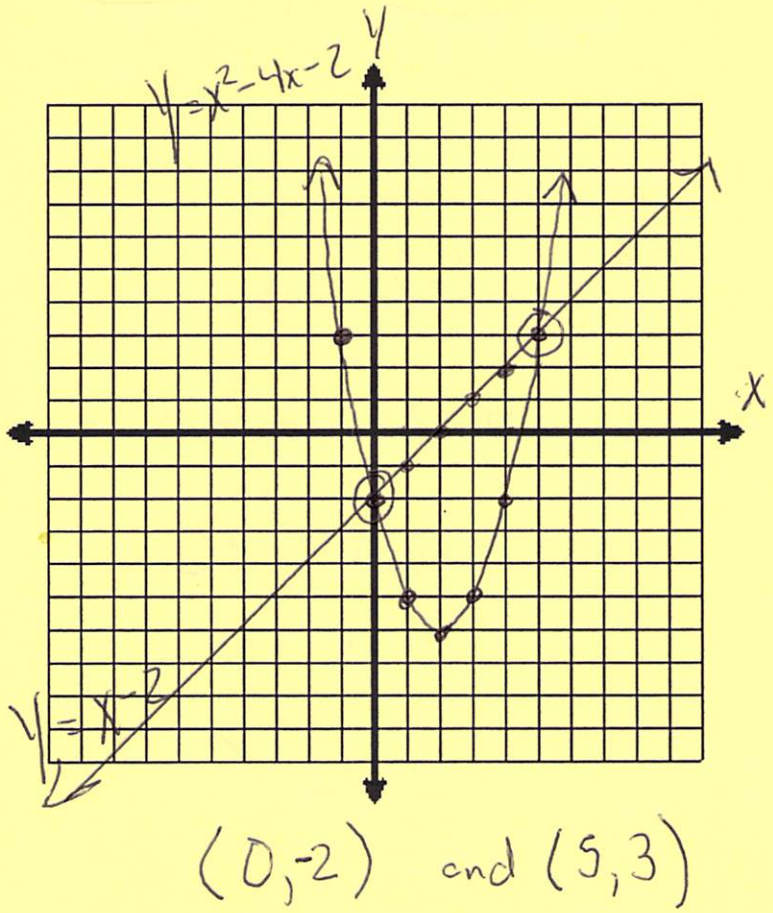
$y = x - 2$

$y = x^2 - 4x - 2$

X	Y

$y = x - 2$

X	Y



(0, -2) and (5, 3)

2. Solve the following system of quadratic-linear equations **algebraically**.

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

$y = 2x + 6$

$2x + 6 = x^2 + 4x + 3$

$-6 \qquad\qquad -6$

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

$-2x \qquad -2x$

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

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

$x + 3 = 0$ | $x - 1 = 0$

$-3 \ -3$ | $+1 \ +1$

$x = -3$ | $x = 1$

$x = -3$	$x = 1$
$y = x^2 + 4x + 3$	$y = x^2 + 4x + 3$
$y = (-3)^2 + 4(-3) + 3$	$y = 1^2 + 4(1) + 3$
$9 - 12 + 3$	$y = 8$
$y = 0$	

$(-3, 0)$ $\qquad$ $(1, 8)$

Check:

$(-3, 0)$

$y = 2x + 6$

$0 = (2)(-3) + 6$

$0 = -6 + 6$

$0 = 0$ ✓

$(1, 8)$

$y = 2x + 6$

$8 = 2(1) + 6$

$8 = 2 + 6$

$8 = 8$ ✓

Solving Quadratic-Linear Systems Classwork Name_____

Solve the following system of quadratic-linear equations **graphically**.

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

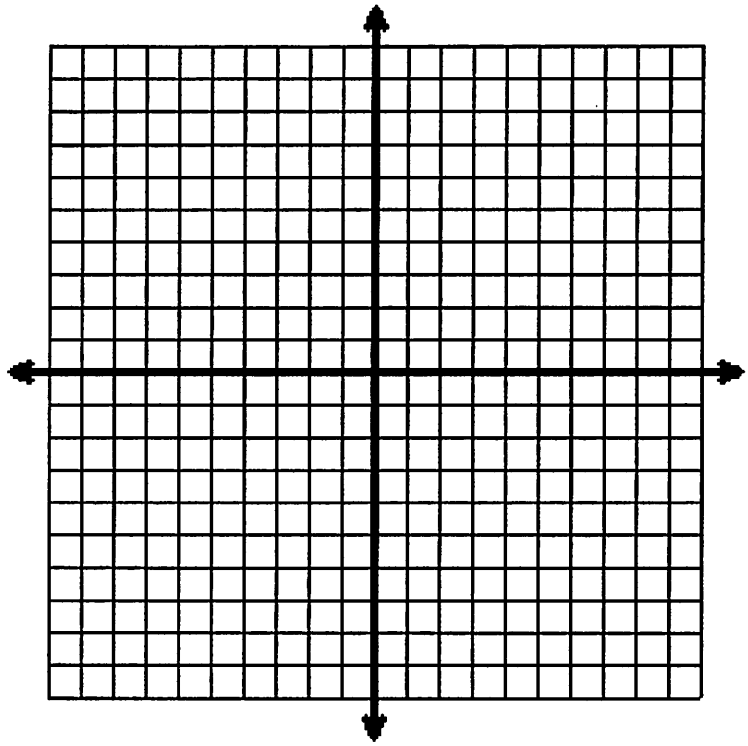
$y = -x + 4$

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

X	Y

$y = -x + 4$

X	Y



Solve the following system of quadratic-linear equations **algebraically**.

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

$y = 3x - 6$