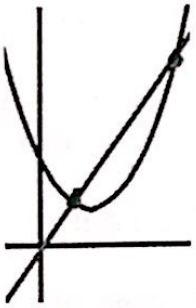
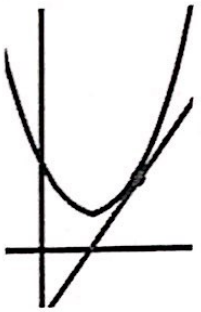
HW = Day 16

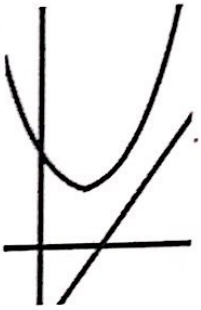
Name: _____ Date: _____

As you know, systems have 2 or more equations. A Linear-Quadratic System of Equations involves a line and a parabola.

The solution is the point(s) where the line intersects with the parabola. There can be one, two, or no solutions to this type of system.







2 solutions | 1 solution | None solutions

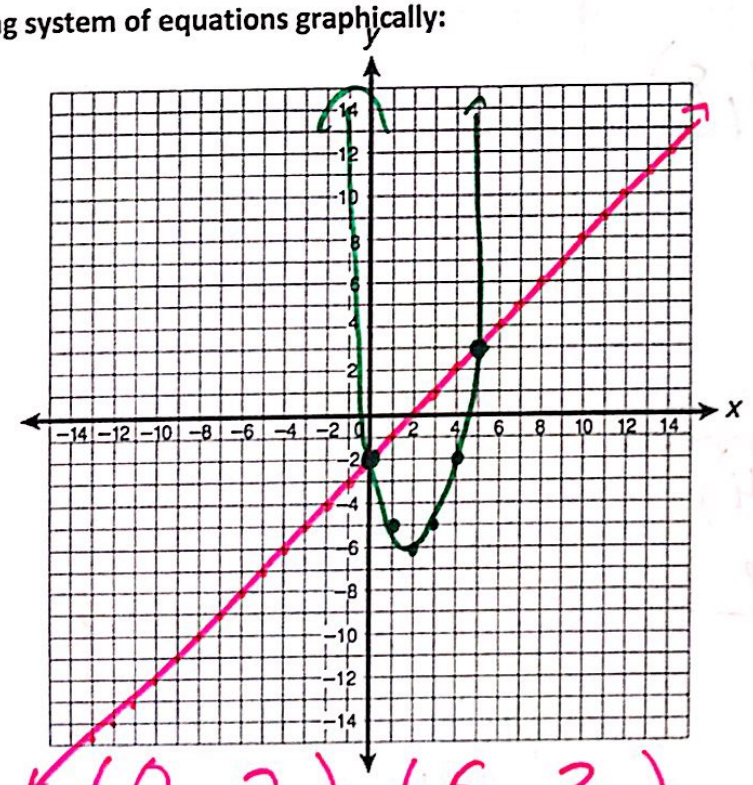
Example 1: Solving Linear-Quadratic Systems by Graphing.

Solve the following system of equations graphically:

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

$y = x - 2$

x	y
0	-2
1	-5
2	-6
3	-5
4	-2



1-4-2

1-6

5, 3

Solution(s): (0, -2) (5, 3)

Check: $y = 0^2 - 4(0) - 2$

$= -2$ ✓

$y = 0 - 2 = -2$ ✓

$y = 5^2 - 4(5) - 2$

$= 25 - 20 - 2$

$= 3$ ✓

$y = 5 - 2 = 3$ ✓

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

$(x-2)^2 = 6$

$(x-2)^2 - 6 = y$

Step 1: Make sure all the equations are either in $y = mx + b$ or $y = ax^2 + bx + c$ form.

Step 2: Graph the line

Step 3: Graph the parabola, using the line of symmetry ($x = -b/2a$ as a starting point)

Step 4: Find the intersection points

25 - 20 - 2

5 - 2 = 3

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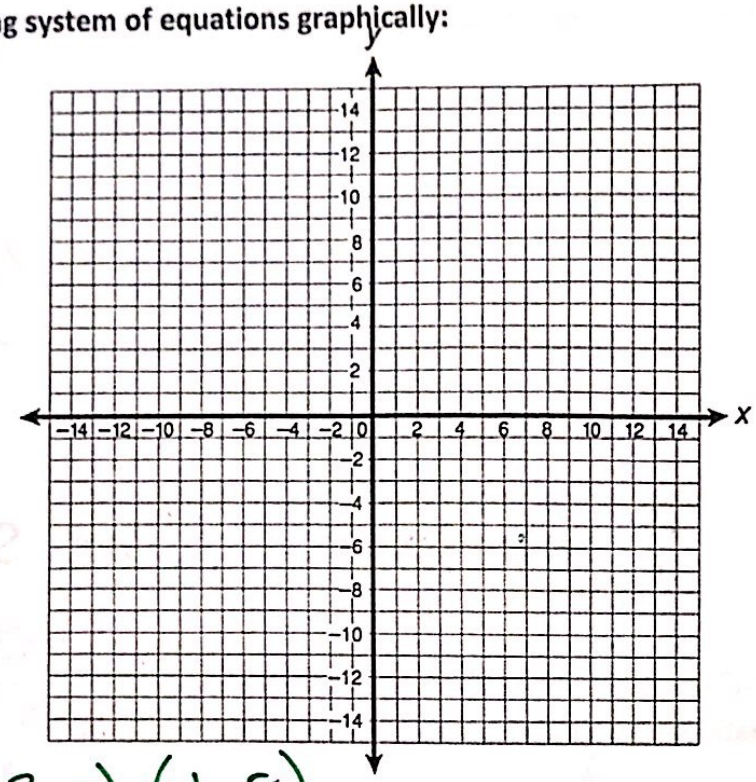
You Try 1!

Solve the following system of equations graphically:

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

$y = 2x + 6$

x	y



Step 1: Make sure all the equations are either in $y = mx + b$ or $y = ax^2 + bx + c$ form.

Step 2: Graph the line

Step 3: Graph the parabola, using the line of symmetry ($x = -b/2a$ as a starting point)

Step 4: Find the intersection points

Solution(s): (−3, 0) (1, 8)

Check:

Example 2A: Solving Linear-Quadratic Systems Algebraically

Solve the system of equations algebraically.

$y = x^2 - x - 6$

$y = 2x - 2$

substitution

(−1, −4)
(4, 6)

$2x - 2 = x^2 - x - 6$

$-2x + 2 \quad -2x + 2$

$0 = x^2 - 3x - 4$

$(x + 1)(x - 4)$

$x = -1, 4$

Check!

In calc.
put $x^2 - x - 6$ in Y_1
put $2x - 2$ in Y_2
2nd trace intersect.

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Example 2B: Solving Linear-Quadratic Systems Algebraically

Solve the system of equations algebraically.

$y = x^2 - x - 6$
$y = x - 10$

$x - 10 = x^2 - x - 6$
$0 = x^2 - 2x + 4$
$x^2 - 2x + 1 = -4 + 1$
$(x-1)^2 = -3$
$x = 1 \pm i\sqrt{3}$

NO Solution !!

Check!

You Try 2!

$x^2 + y = -14$ $x - y = 6$	**Check:**
$y = x^2$ $y = 2x + 3$	**Check:**