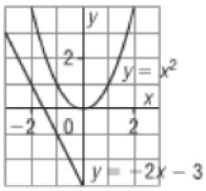
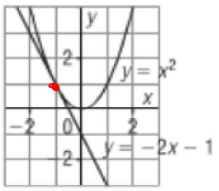
Pre-Calculus 11 Enriched Systems of Equations & Inequalities

Lesson 1 Solving Systems of Equations Graphically

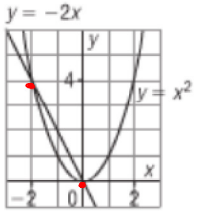
A ***linear-quadratic system*** of equations may have 0, 1 or 2 solutions. The solution is an ordered pair (x, y) that satisfies the two equations in the system (where the graphs intersect).



This system has 0 solutions.



This system has 1 solution.



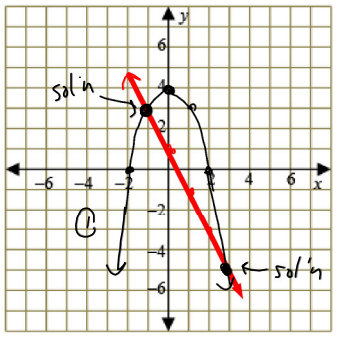
This system has 2 solutions.

Example 1
Solve, graphically.

$y = -x^2 + 4$ ①
$y = -2x + 1$ ②

$y = mx + b$
plot y-int
use slope to get a 2nd point $-\frac{2}{1}$
down 2, right 1

sol'n $(-1, 3)$ and $(3, -5)$

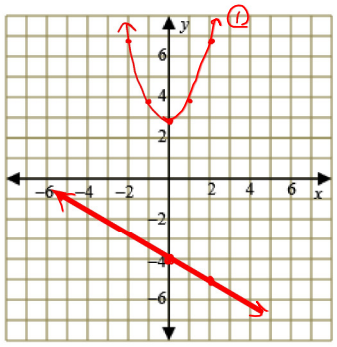


Example 2
Solve, graphically.

$y = x^2 + 3$ ①
$y = -\frac{1}{2}x - 4$

$-\frac{1}{2}$ $\frac{\text{rise}}{\text{run}}$ down 1, right 2

No sol'n



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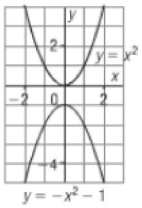
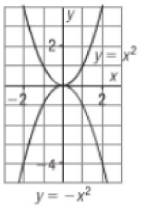
A quadratic-quadratic system of equations may have 0, 1, 2 or infinite solutions.
The solution is a set of ordered pairs that satisfies both equations (where the graphs intersect).

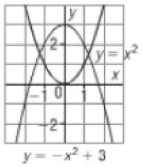
This system has 0 solutions.



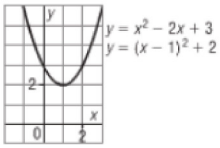
This system has 1 solution.



This system has 2 solutions.



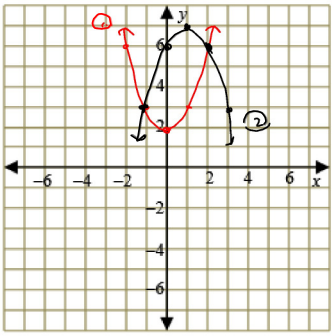
This system has infinite solutions.



Example 3
Solve, graphically.

$y = x^2 + 2$ ①
$y = -(x-1)^2 + 7$ ②

sol'n
(-1, 3) and (2, 6)



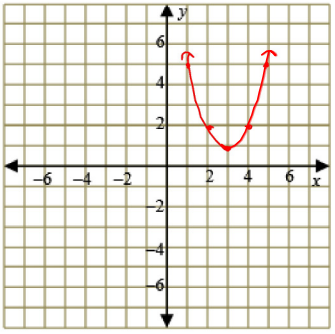
Example 4
Solve, graphically.

$y = (x-3)^2 + 1$
$y + 6x = x^2 + 10$

$y = x^2 - 6x + 10$
$y = (x^2 - 6x + 9) + 10 - 9$
$y = (x-3)^2 + 1$

same curve

∴ infinite # of sol'ns along the curve $y = (x-3)^2 + 1$



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3b, c, d, g
4a-c