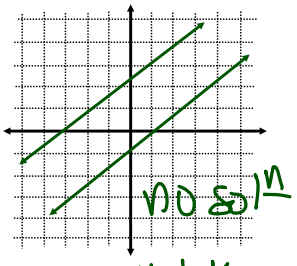
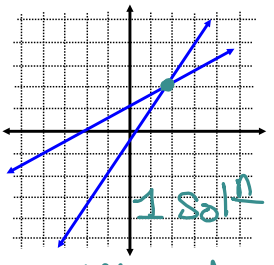
8.1 Solving Systems Graphically

* The solutions to a system of equations are the coordinates of the points of intersection , if they exist, of the graphs of the functions.

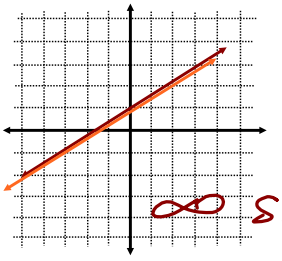
> with 2 linear equations, there can be 0, 1, or infinite solutions



* parallel lines
* same slope

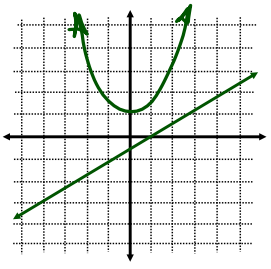


* different slopes

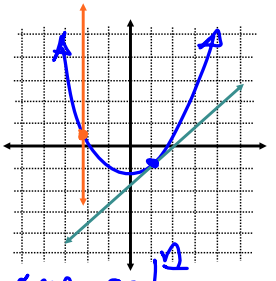


* coincident lines
→ multiples of one another

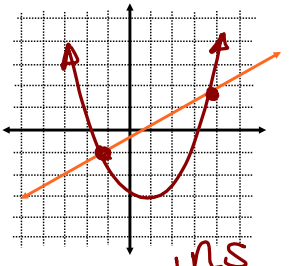
> with 1 linear equation and 1 quadratic equation, there can be 0, 1, or 2 solutions



no sol^n

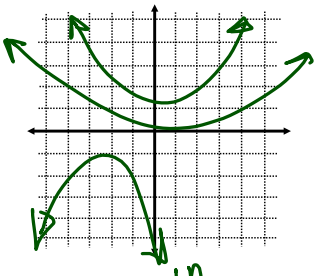


one sol^n
→ tangent line
→ vertical line

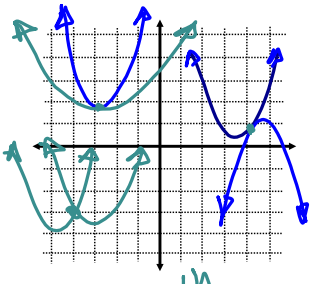


2 sol^ns

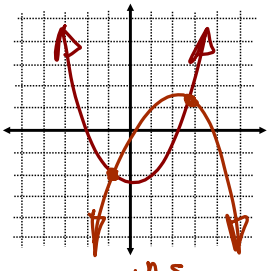
> with 2 quadratic equations, there can be 0, 1, 2 or infinite solutions



no sol^n



one sol^n



2 sol^ns

AND coincident parabolas yield ∞ sol^ns

See example 1 pg. 427

ex. Solve graphically:

$4x - y + 3 = 0$

$2x^2 + 8x - y + 3 = 0$

① $y = 4x + 3$

② $y = 2x^2 + 8x + 3$

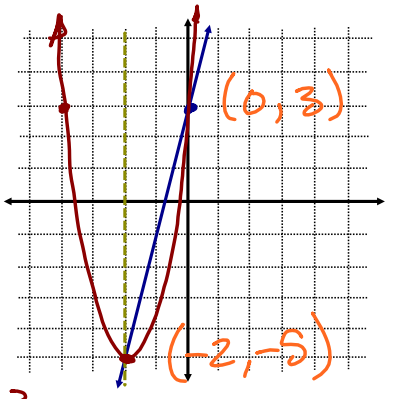
$x = \frac{-b}{2a}$

$= \frac{-8}{2(2)} = -2$

$y_V = 2(-2)^2 + 8(-2) + 3$

$= 8 - 16 + 3$

$= -5$



your turn pg. 429

calculator

① plot both eqn^s

② 2nd calc → 5: intersect

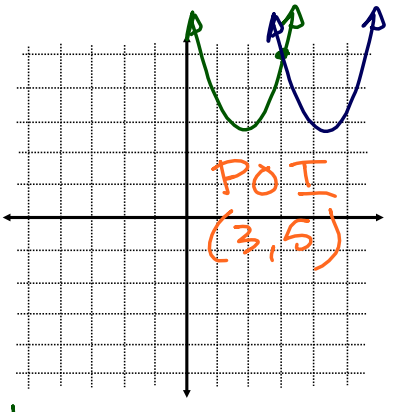
③ move cursor close to a POI

④ press enter 3 times

ex. Solve graphically:

$2x^2 - 16x - y = -35 \Rightarrow y = 2x^2 - 16x + 35$

$2x^2 - 8x - y = -11 \Rightarrow y = 2x^2 - 8x + 11$



Your turn pg. 430

Algebraically

$2x^2 - 16x + 35 = 2x^2 - 8x + 11$

$35 - 11 = -8x + 16x$

$\frac{24}{8} = \frac{8x}{8} \Rightarrow \boxed{x = 3}$

plug into either eqn^n and get (y)

since the parabolas have the same leading coefficient, the resulting eqn^n is linear. Thus, there is only one POI.

Homefun: Pg. 435 #1-3, 4acd, 7, 9-11, 14, 17