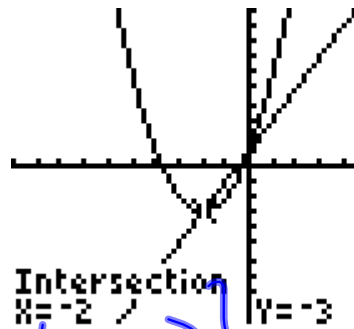
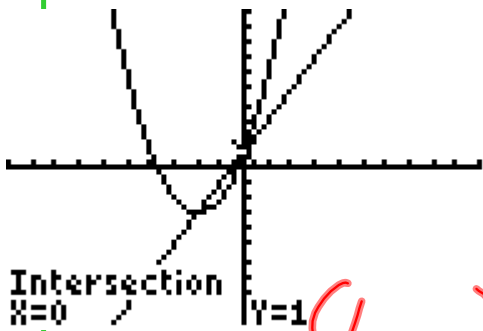
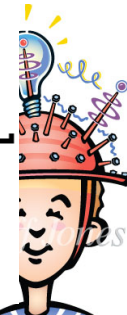


WARM UP:

Solve $y = x^2 + 4x + 1$ and $y = 2x + 1$ graphically
(use your calculator).



$$x=-2, y=-3$$



$$\{(0, 1), (-2, -3)\}$$

$$x=0, y=1$$

~~Quadratic-Linear~~ Systems of Equations
2x2 (Solved Algebraically)

What is a system?
2 equations w/ 2 variables

What do solutions look like?
Coordinates (x,y)

So the solution ALWAYS requires an x-value and a y-value

Example 1: Solve the following system of equations algebraically:

PROCEDURE:

- ① Solve one equation for x = OR y =
- ② Substitute into other eq.
- ③ Solve for Remaining variable
 $16^2 - 4 \cdot 4 \cdot -9$
- ④ Plug in for other variable

$$\begin{aligned} 5 &= y - x & y &= 5 + x \\ +x & & +x & \\ \hline 4x^2 &= -17x + y + 4 \end{aligned}$$

$$4x^2 = -17x + 5 + x + 4$$

$$4x^2 = -16x + 9$$

$$4x^2 + 16x - 9 = 0$$

$$400 \quad x = \frac{-16 \pm \sqrt{400}}{2(4)}$$

$$x = \frac{-16 + 20}{8} \quad x = \frac{-16 - 20}{8}$$

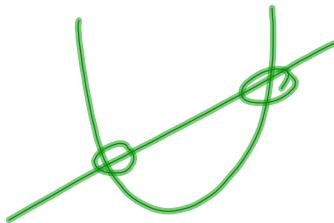
$$x = \frac{1}{2} \quad x = -\frac{9}{2}$$

$$y = 5 + x$$

$$y = 5 + \frac{1}{2}$$

$$y = 5 + \frac{-9}{2}$$

$$\left\{ \left(\frac{1}{2}, \frac{11}{2} \right), \left(-\frac{9}{2}, \frac{1}{2} \right) \right\}$$



Example 2:

Solve the following system of equations algebraically:

$$x + y = 5$$

$$x = 5 - y$$

$$(x+3)^2 + (y-3)^2 = 53$$

$$(5-y+3)^2 + (y-3)^2 = 53$$

$$(8-y)(8-y) + (y-3)(y-3) - 53 = 0$$

$$64 - 16y + y^2 + y^2 - 6y + 9 - 53 = 0$$

$$2y^2 - 22y + 20 = 0$$

$$y^2 - 11y + 10 = 0$$

$$(y-1)(y-10) = 0$$

$$y = 1$$

$$y = 10$$

$$\left\{ (4, 1), (-5, 10) \right\}$$

$$x = 5 - y$$

Example 3:

REGENTS QUESTION 6/2016:

Solve the system of equations algebraically:

$$(x - 3)^2 + (y + 2)^2 = 16$$

$$2x + 2y = 10$$

$$\begin{matrix} (3, +2) \\ (7, -2) \end{matrix}$$



$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

EXIT TICKET:



a. What does finding the solution to a system of equations mean (graphically)?

b. How do you verify that your solutions are correct?

Homework: p. 237 #21, 24, 28

In 18–35, find each common solution algebraically. Express irrational roots in simplest radical form.

$$\begin{aligned} 21. \quad & y = x^2 - 8x + 6 \\ & 2x - y = 10 \end{aligned}$$

$$\begin{aligned} 24. \quad & y = 2x^2 - 6x + 7 \\ & y = x + 4 \end{aligned}$$

$$\begin{aligned} 28. \quad & y = x^2 + 4x + 4 \\ & y = 4x + 6 \end{aligned}$$