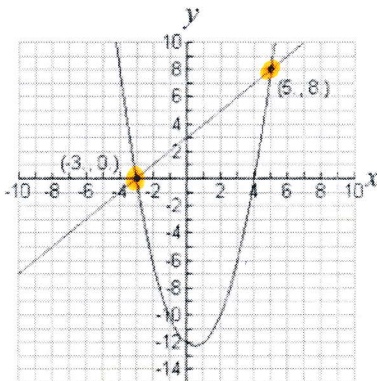


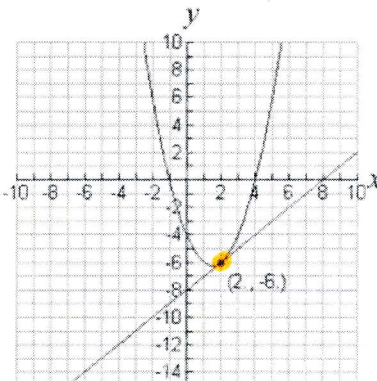
Notes: Solving Quadratic-Linear Systems Graphically

- A **quadratic-linear** system consists of a **quadratic** equation and a **linear** equation.
- The **solution** of a quadratic-linear system is the **set of ordered pairs** of numbers that make both equations true.
- Depending on how many times the line **intersects** the curve, the solution set may contain **two** ordered pairs, **one** ordered pair, or **no** ordered pairs.

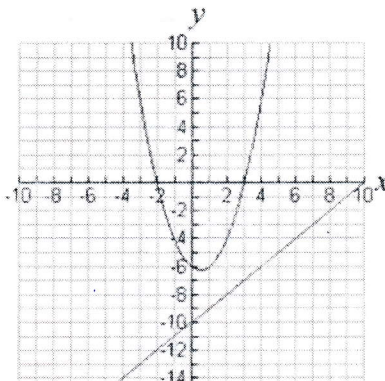
* solution set / point of intersections are the same thing



2 solutions



1 solution



no solution

3 types

Example 1: solve the Quadratic-linear System:

graph the linear function

Step 1:

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

$$y - x = -4 \rightarrow \text{Linear Function}$$

$$y = x - 4$$

$$m = \frac{1}{1} \quad b = -4$$

$$y = mx + b$$

slope \downarrow
y-intercept

graph the quadratic function using axis of symmetry

Step 2:

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

$$a = 1$$

$$b = -6$$

$$c = 6$$

axis of sym.

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

$$x = \frac{-(-6)}{2(1)} = 3$$

fill in the table by using ratio

Step 3:

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

vertex axis of sym. **3** **-3**

Step 2b function notation

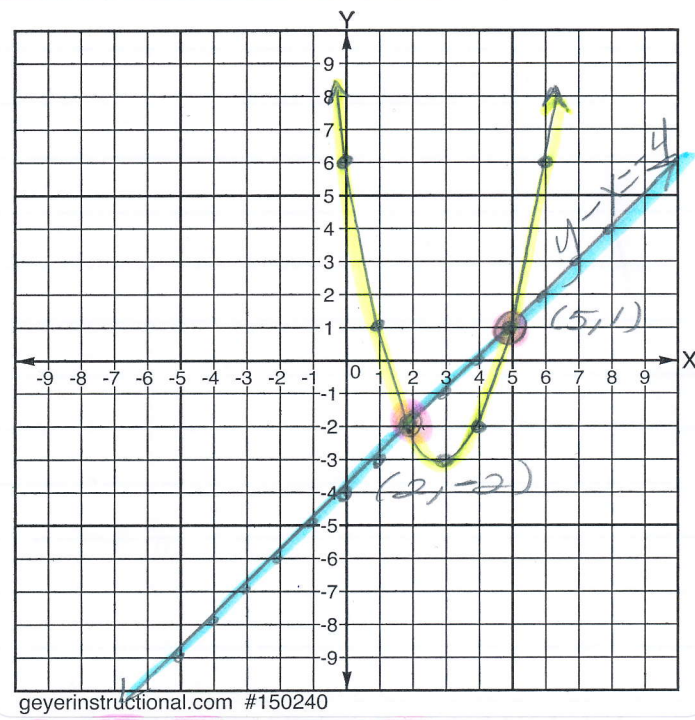
$$f(x) = x^2 - 6x + 6$$

$$f(3) = (3)^2 - 6(3) + 6$$

$$= 9 - 18 + 6$$

$$= -9 + 6$$

$$f(2) = -3$$



Has 2 solution sets at (2, -2) & (5, 1)

graph the linear function

Example 2: solve

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

$$y - 2x = -2 \rightarrow y = mx + b$$

$$\frac{+2x \quad +2x}{y = 2x - 2}$$

$$m = \frac{2}{1} \quad b = -2$$

Step 2

$$y = x^2 - 2x + 2 \quad a = 1$$

$$b = -2$$

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

$$c = 2$$

$$x = \frac{-(-2)}{2(1)}$$

$$x = 1$$

graph the quadratic by using the axis of sym.

Step 3

All in table

x	y
-2	10
-1	5
0	2
1	1
2	2
3	5
4	10

vertex axis of sym

1	1
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find "y"

Step 2b

f(x)

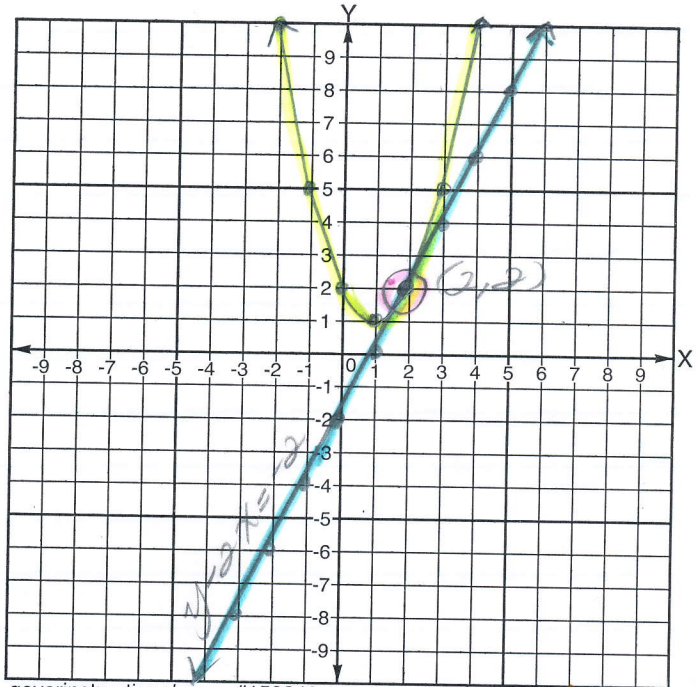
$$y = x^2 - 2x + 2$$

$$f(1) = (1)^2 - 2(1) + 2$$

$$= 1 - 2 + 2$$

$$f(1) = -1 + 2$$

$$f(1) = 1$$



Has 1 solution set at (2, 2)

Example 3, Solve

$$y = x^2 - 2x + 1$$

Step 1 graph the linear function

$$y = \frac{x - 6}{3}$$

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

$$m = \frac{1}{3} \quad b = -2$$

graph the quadratic function
Step 2a find the axis of sym

$$y = x^2 - 2x + 1 \quad a = 1, b = -2, c = 1$$

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

$$x = \frac{-(-2)}{2(1)} = 1$$

fill in the table
Step 3

x	y
-2	9
-1	4
0	1
1	0
2	1
3	4
4	9

vertex axis of sym

find "y"

Step 2b

$$f(x) = y = x^2 - 2x + 1$$

$$f(1) = (1)^2 - 2(1) + 1$$

$$= 1 - 2 + 1$$

$$= -1 + 1$$

$$f(1) = 0$$

