

# Solving Systems

ex)

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

$$y - 6 = 2x$$

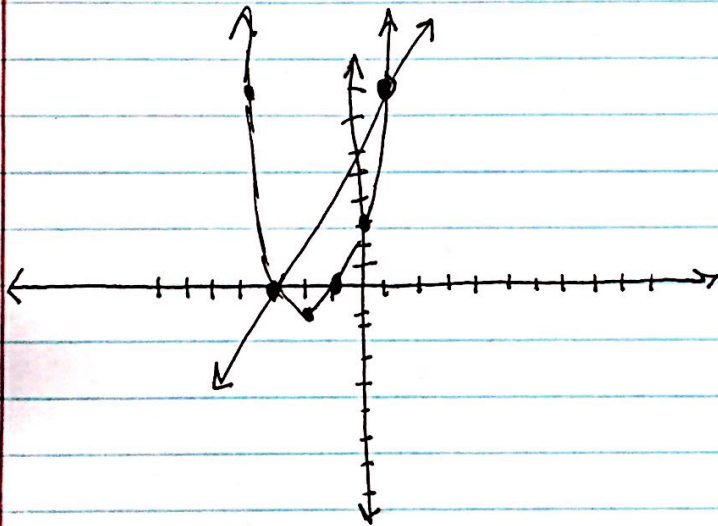
## Graphing Method

Solve for  $y$  in both equations:

$$y_1 = x^2 + 4x + 3$$

$$y_2 = 2x + 6$$

$$y_2 = 2x + 6$$



$$\begin{array}{l} (1, 8) \\ (-3, 0) \end{array}$$

## Algebraically

Solve for  $y$ :  $y = x^2 + 4x + 3$   
 $y = 2x + 6$

① Set equations equal.

$$2x + 6 = x^2 + 4x + 3$$

② Get one side equal to zero.

$$\begin{array}{r} 2x + 6 = x^2 + 4x + 3 \\ -2x - 6 \quad \quad -2x - 6 \end{array}$$

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

③ Solve by factoring / quad formula / complete the square

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

$$0 = (x+3)(x-1)$$

$$\begin{array}{ll} x+3=0 & x-1=0 \\ x=-3 & x=1 \end{array}$$

④ Substitute the  $x$ -values into either of the original equations to get  $y$ -values.

$$x=1 \rightarrow y = (2)(1) + 6 = 8$$

$$x=-3 \rightarrow y = 2(-3) + 6 = 0$$

$$\boxed{(1, 8) \text{ \& } (-3, 0)}$$