

### Lesson 7.2 ~ Solving a System of Linear Equations Graphically

The first of three solving methods is graphing. There are several methods to graph a linear equation; we will graph using the form  $y = mx + b$ .

Example #1: Solve this linear system graphically (this requires accurate sketches of the graphs), and then verify the result.

$$\textcircled{1} 3x + y = 10$$

$$\textcircled{2} x - 2y = 8$$

$$\textcircled{1} \begin{array}{r} 3x + y = 10 \\ -3x \quad -3x \end{array}$$

$$y = -3x + 10$$

verify:

$$\textcircled{1} \begin{array}{r} 3(4) + (-2) = 10? \\ 12 - 2 = 10 \\ 10 = 10 \checkmark \end{array}$$

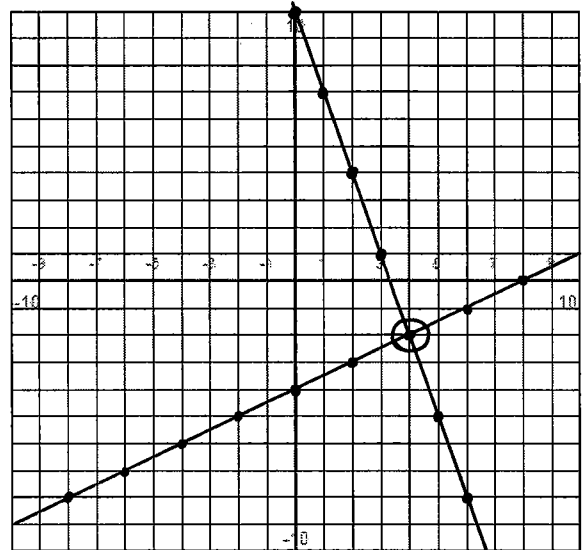
$$\textcircled{2} \begin{array}{r} 4 - 2(-2) = 8? \\ 4 + 4 = 8 \\ 8 = 8 \checkmark \end{array}$$

$$\textcircled{2} \begin{array}{r} x - 2y = 8 \\ +2y \quad +2y \end{array}$$

$$x = 2y + 8$$

$$\frac{x - 8}{2} = \frac{2y}{2}$$

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



Solution:  $(4, -2)$

Example #2: Solve this linear system graphically, and then verify the result.

$$\textcircled{1} x - y = -2$$

$$\textcircled{2} 4x + 2y = 16$$

$$\textcircled{1} \begin{array}{r} x - y = -2 \\ -x \quad -x \end{array}$$

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

$$y = x + 2$$

$$\textcircled{2} \begin{array}{r} 4x + 2y = 16 \\ -4x \quad -4x \end{array}$$

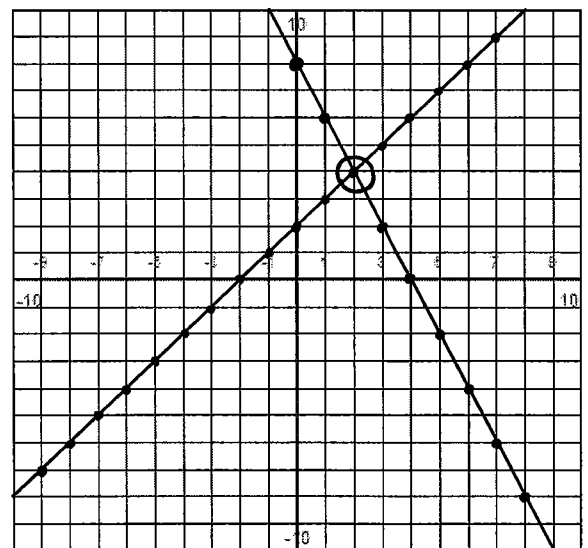
$$\frac{2y}{2} = \frac{-4x + 16}{2} \frac{16}{2}$$

$$y = -2x + 8$$

verify:

$$\textcircled{1} \begin{array}{r} 2 - 4 = -2? \\ -2 = -2 \checkmark \end{array}$$

$$\textcircled{2} \begin{array}{r} 4(2) + 2(4) = 16? \\ 8 + 8 = 16 \\ 16 = 16 \checkmark \end{array}$$



Solution:  $(2, 4)$