Name: _____**Key**_____   Date: _____

7/8A   Classwork 10.1

Systems of Equations (Graphing)

Aim: How can we find the solution to multiple linear functions?

❖ If two or more equations are given, we call this a **system of equations**. The **solution** to a system of equations consists of the set of all ordered pairs, (x, y) that satisfy (make true) all of the equations in the system. This point is called the **point of intersection (P.O.I.)**.

*Labeling now is a must!

Example 1: Solve the system of equations below by graphing. Show all work and check your answers.

$$y = x + 3 \qquad\qquad y = -2x + 6$$

$$m = 1 \quad b = 3 \qquad\qquad m = -2 \quad b = 6$$

Step 1: Graph both linear equations.

Step 2: Identify the POI.

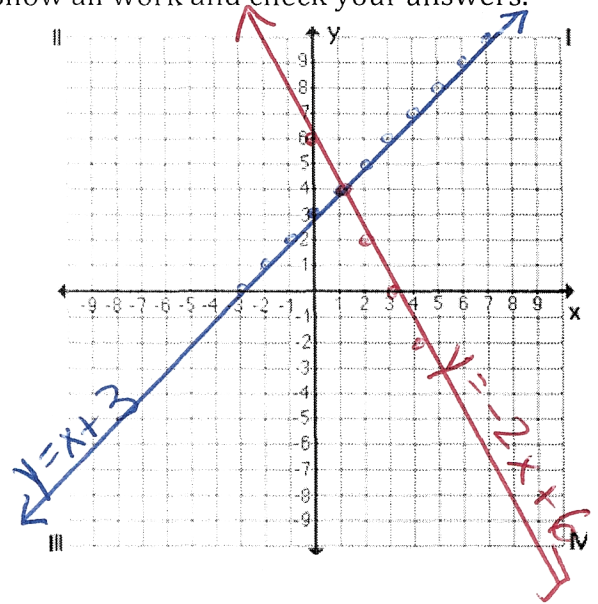**Step 3:** Check that the solution is a point on both lines.

$$4 = (1) + 3 \qquad\qquad 4 = -2(1) + 6$$
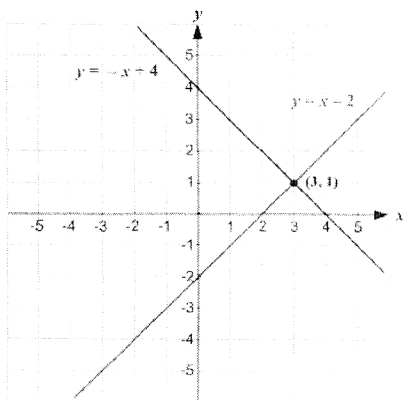$$4 = 4 \checkmark \qquad\qquad 4 = -2 + 6$$
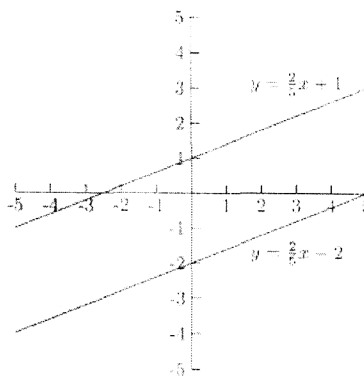$$\qquad\qquad\qquad\qquad 4 = 4 \checkmark$$

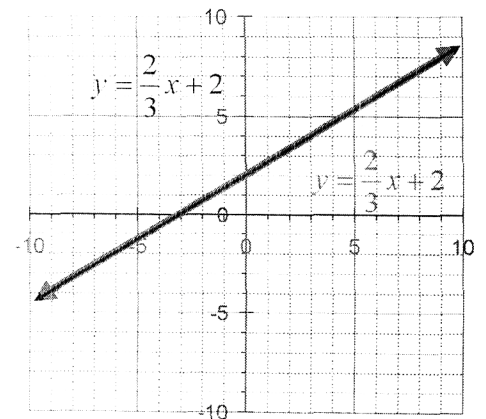➤ The solution is: $(1, 4)$

A system of equations may have one one solution, no solution, or infinitely many solutions.

one solution
(3, 1)

no solution
*never intersect

infinitely
* same line

Example 2: Solve the system of equations below by graphing. Show all work and check your answers.
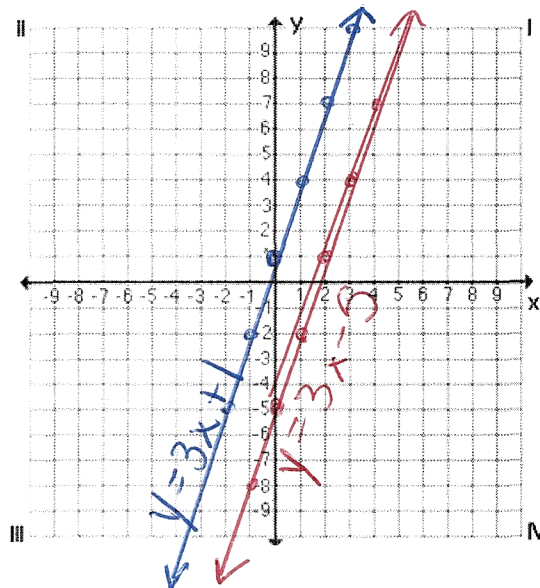
y = 3x + 1   y = 3x – 5

$m = 3$ $m = 3$

$b = 1$ $b = -5$

➤ The solution is: **no solution**

Example 3: Solve the system of equations below by graphing. Show all work and check your answers.

* **label with original** *

y + 2x = 5   y – 2 = x

$-2x \quad -2x$ $+2 \quad +2$

$y = -2x + 5$ $y = x + 2$

$m = -2 \quad b = 5$ $m = 1 \quad b = 2$

$3 \not= 2(1) = 5$ $3 - 2 = 1$

$3 + 2 = 5$ $1 = 1 ✓$

$5 = 5 ✓$
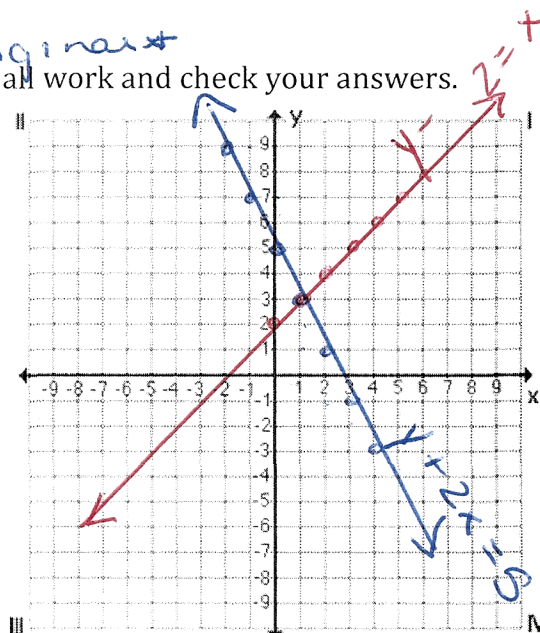
➤ The solution is: **(1, 3)**

Example 4: Which of the following is a **solution** to the system of equations consisting of
y = 4x + 11 and y = −x + 1?

a) (0, 11)
b) (−2, 3) $3 = 4(-2) + 11$ $3 = -(-2) + 1$
c) (3, −2)
d) (2, 5)