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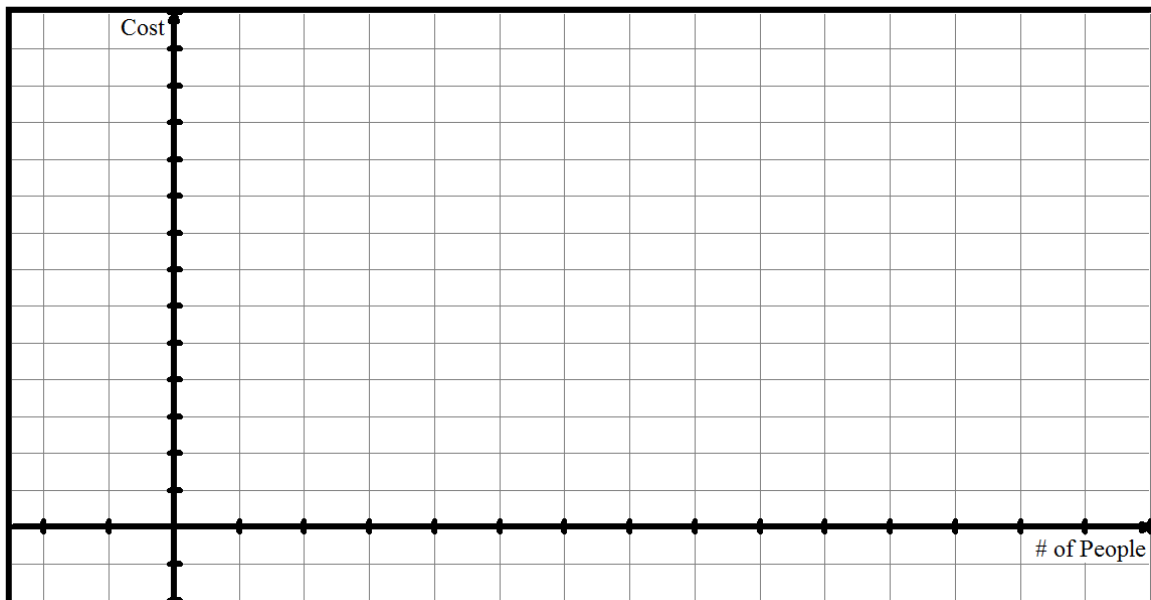
(A) **Lesson Objectives:**

- a. Introduce a Linear System through a real world application
- b. Review how to change the equation of a line from standard form $Ax + By = C$ to slope-intercept form of $y = mx + b$
- c. Graphically, using technology, determine the intersection point of two lines and algebraically verify the intersection point.
- d. Understand that linear systems can have no solutions, a unique solution, or infinite solutions

(B) **Opening Investigation:**

Mr Santowski is planning on a birthday party for his youngest son, Ian. At Party Kingdom, they will charge me a fee of 2,000 pesos plus 100 pesos/person attending. At The Party Center, they will charge me a fee of 3,000 pesos plus 50 pesos/person.

- a. Write a linear equation representing the cost at Party Kingdom.
- b. Graph the relation on your TI-84. What window settings did you use?
- c. Write a linear equation representing the cost at The Party Center.
- d. Using the same window settings as Question b., graph the relation on your TI-84.
- e. Where do the two lines seem to cross/intersect?
- f. How could you verify that your intersection point is correct?
- g. What does the intersection point MEAN given the two party packages?
- h. Is one party package better than another? Explain your answer.



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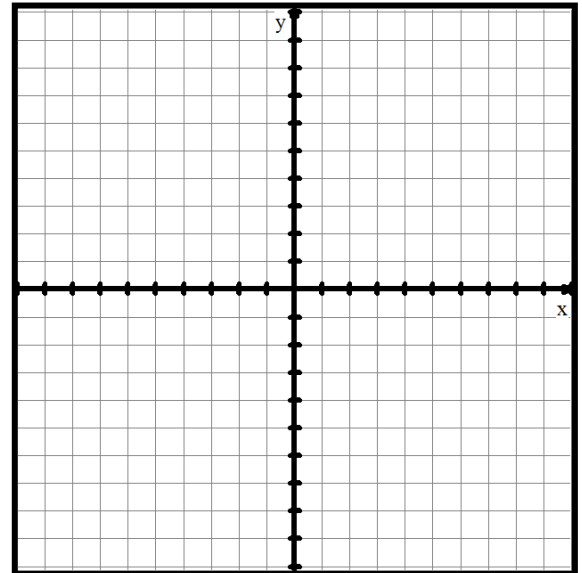
(C) **Linear Systems on the TI-84**

- Zoom Standard your TI-84
- Graph the line $x - y + 2 = 0$ on the grid
- Graph the line $7x - 6y = 0$ on the grid
- Where do the lines seem to meet?

- How should you adjust your window settings?

- How would you verify your solution?

- Verify your solution

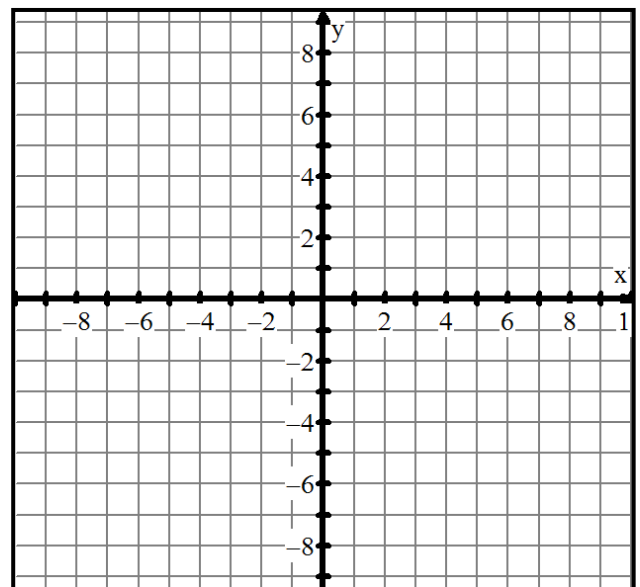
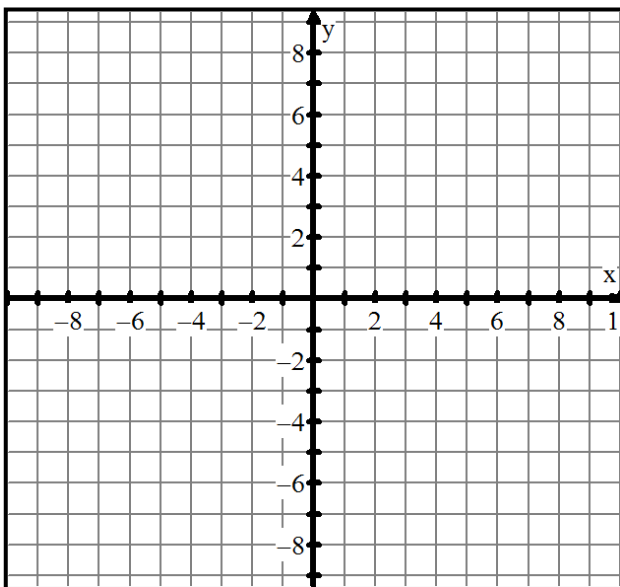


(D) **Terms to Know**

- Solution to a Linear System:** a point that satisfies both the relations in the system of linear equations. We also refer to the solution as the **point of intersection**.
- Solutions can be (i) zero, (ii) one, (iii) infinite → HOW??
- The number of solutions can be PREDICTED → HOW???

(E) **Further Examples for Classwork**

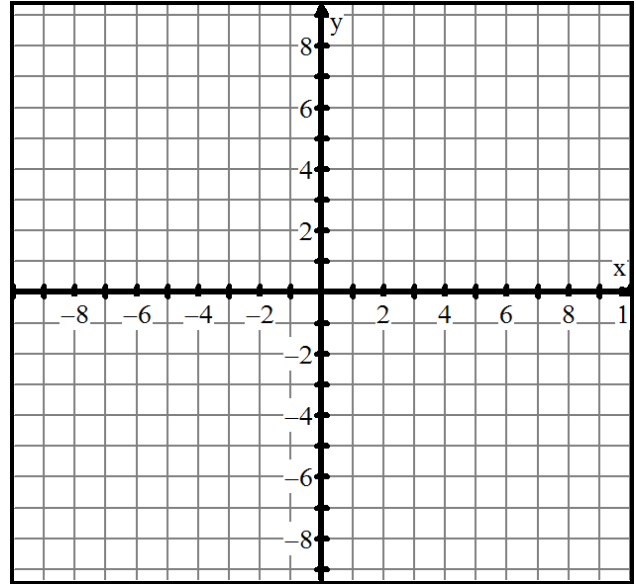
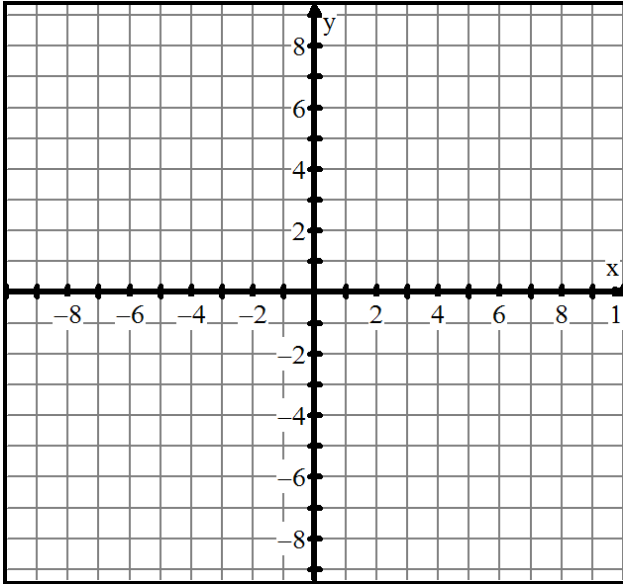
- Example #1: Solve and verify the following linear system by graphing: $y = 3x - 5$ and $2x + 3y - 6 = 0$
- Example #2: Solve and verify the following linear system by graphing: $3x + 4y = 12$ and $36 - 12y = 9x$



Date:

Title:

- a. Example #3: Solve and verify the following linear system by graphing: $x - \frac{1}{4}y = 2$ and $y = 4x - 3$
- b. Example #4: Solve and verify the following linear system by graphing: $y = -x + 5$ and $y = 2x - 6$



(F) Further Examples:

- a. WITHOUT graphing the following linear equations, you can PREDICT whether the linear system has 0,1, or infinite solutions → HOW???
- b. Example 1 → $y = 3x + 2$ and $y = 4 - 2x$
- c. Example 2 → $y = \frac{1}{2}x + 3$ and $y = 2x - 5$
- d. Example 3 → $5x + y = -1$ and $y = 7 - 5x$
- e. Example 4 → $y = \frac{3}{4}x + \frac{1}{2}$ and $8y - 6x = 4$

(G) Homework/Resources

- HOMEWORK: from the Nelson Textbook: S4.5, p245-247, Q3,7a,10,11,12,13,14
- Help from PurpleMath with slope → <http://www.purplemath.com/modules/systlin1.htm>
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