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Why?

$$y = 4x + 1500$$

$$y = 10x$$

6-1 Graphing Systems of Equations

Vocabulary

System of Equations - A set of equations with the same variable.

The ordered pair that is a solution of both equations is the **Solution of the system**.

A system of two linear equations can have one solution, an infinite number of solutions or no solution.

Consistent - If a system has at least one solution (the graphs intersect at one point).

Independent - exactly one solution

Dependent - infinite number of solutions (same line)

Inconsistent - No solution (parallel lines)

One method of solving a system of equations is to graph the equations carefully on the same coordinate grid and find their point of intersection. This point is the solution of the system.

Please notice the **Study Tip** box on the top left of page 336.

When both equations are of the form $y=mx + b$ the values of m and b can determine the number of solutions.

Compare <u>m</u> and <u>b</u>	Number of <u>Solutions</u>
different m values	1
same m value but different b values	none
same m value and same b value	infinite

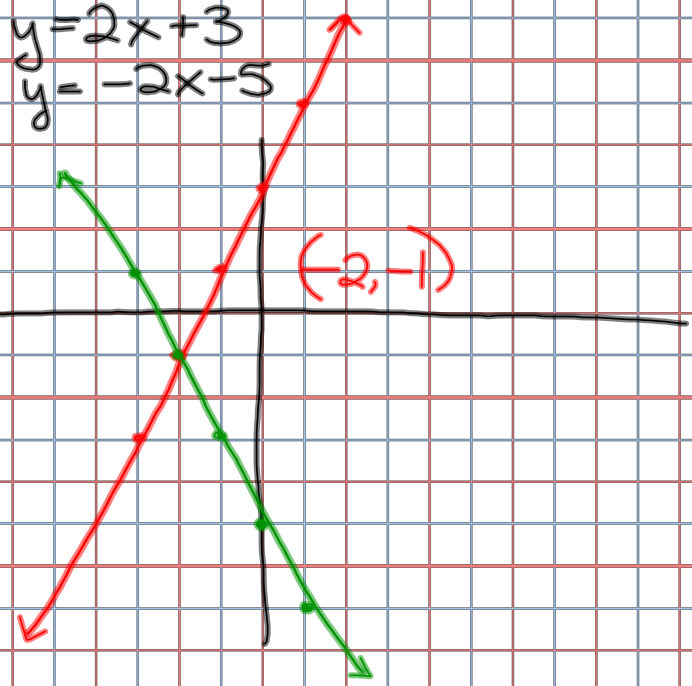
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#1A.

$$y = 2x + 3$$
$$y = -2x - 5$$

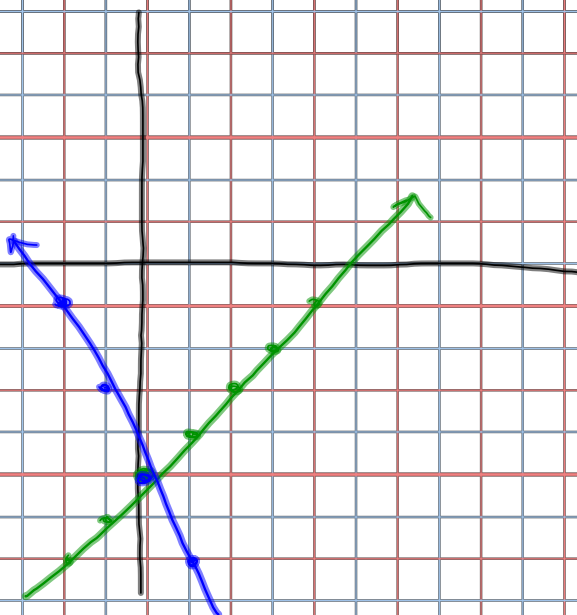
consistent
independent

$(-2, -1)$



1B. $y = x - 5$
 $y = -2x - 5$

consistent
independent



$$2A. \quad \begin{aligned} x - y &= 2 \\ 3y + 2x &= 9 \end{aligned}$$

Step 1: Change to slope intercept form

$$\begin{aligned} x - y &= 2 \\ -x - y &= -x + 2 \quad (-) \\ \hline y &= x - 2 \end{aligned}$$

$$\begin{aligned} 3y + 2x &= 9 \\ 3y &= -2x + 9 \\ \hline y &= -\frac{2}{3}x + 3 \end{aligned}$$

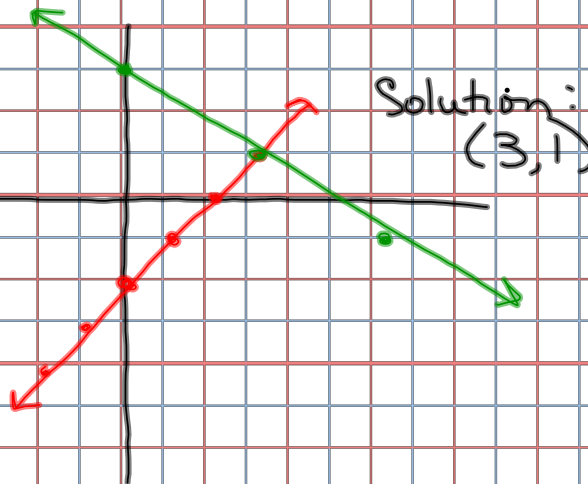
Step 2: Graph the lines on one coordinate plane

$$\begin{matrix} x & y \\ (3, 1) \end{matrix}$$

$$y = x - 2$$

$$1 = 3 - 2$$

$$1 = 1 \quad \checkmark \text{ check}$$

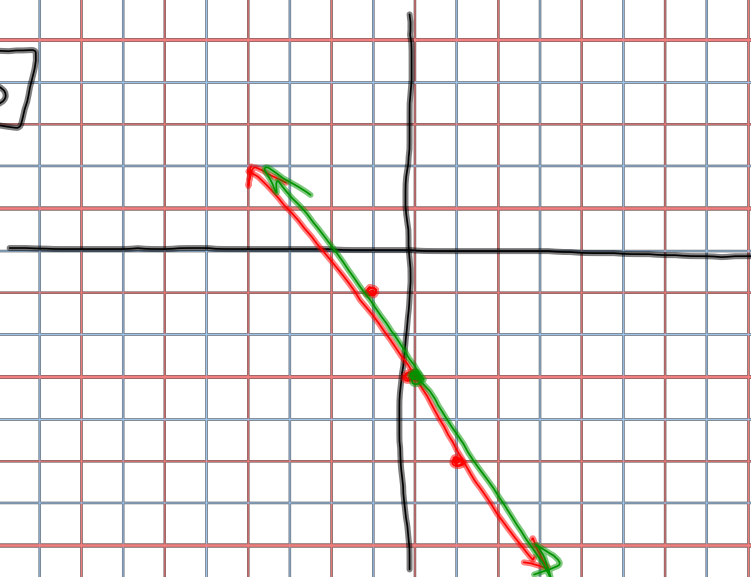


2B.
$$\boxed{y = -2x - 3}$$

$$6x + 3y = -9 \quad \text{rewrite to slope intercept form}$$

$$\frac{3y}{3} = \frac{-6x}{3} - \frac{9}{3}$$

$$\boxed{y = -2x - 3}$$



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#3

Joe $y = 10x + 14$

Josh $y = 7x + 26$

Graph using your graphing calculator

I set my window to

$$\begin{aligned} X_{\min} &= -1 \\ X_{\max} &= 10 \\ X_{\text{sc1}} &= 1 \\ Y_{\min} &= -1 \\ Y_{\max} &= 60 \end{aligned}$$

move the cursor to
the point of intersection

$$x = 4 \quad y = 54 \quad (4, 54)$$

substitute to check

Answer: 4 weeks

The boys will have
\$54.00

$$54 = 10(4) + 14$$

$$54 = 40 + 14$$

$$54 = 54 \quad \checkmark$$

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1-6 identify the lines

7-8 graph on paper

9 use graphing calculator