

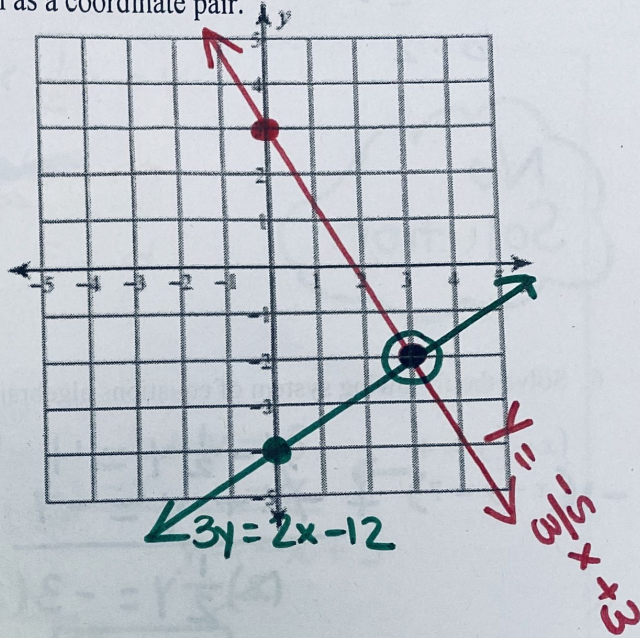
MIXED PRACTICE - Systems of Linear Equations and Inequalities

1. Solve the following system of equations graphically. State the solution as a coordinate pair.

$$\begin{cases} y = -\frac{5}{3}x + 3 \\ 3y = 2x - 12 \end{cases} \rightarrow m = -\frac{5}{3} \downarrow \quad b = 3$$

$$y = \frac{2}{3}x - 4 \rightarrow m = \frac{2}{3} \uparrow \quad b = -4$$

Solution: (3, -2)



2. Solve the following system of equations algebraically.

$$\begin{cases} 8x + 14y = 4 \\ -6x - 7y = -10 \end{cases} \rightarrow \begin{array}{r} 8x + 14y = 4 \\ + 12x + 14y = -20 \\ \hline -4x = -16 \\ \hline x = 4 \end{array}$$

Solution: (4, -2)

$$\begin{array}{r} 8x + 14y = 4 \\ 8(4) + 14y = 4 \\ 32 + 14y = 4 \\ -32 \quad -32 \\ \hline 14y = -28 \\ \hline y = -2 \end{array}$$

$$\frac{14y}{14} = \frac{-28}{14}$$

$$y = -2$$

3. Solve the following system of equations algebraically.

$$\begin{cases} 2x - 3y = -1 \\ y = x - 1 \end{cases} \rightarrow 2x - 3(x - 1) = -1$$

$$2x - 3x + 3 = -1$$

$$-1x + 3 = -1$$

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

$$x = 4$$

Solution: (4, 3)

$$\begin{array}{l} y = x - 1 \\ y = 4 - 1 \\ \hline y = 3 \end{array}$$

4. Which ordered pair satisfies the system of equations below?

* "check" each
* OR solve!

- (1) (3, -1)
- (2) (2.5, 0.5)
- (3) (2.5, -0.5) ✓
- (4) (5, -3)

$$\begin{array}{r} + \begin{cases} 3x - y = 8 \\ x + y = 2 \end{cases} \\ \hline 4x = 10 \\ \hline x = 2.5 \end{array}$$

$$\begin{array}{r} -2.5 + y = 2 \\ \hline y = -0.5 \end{array}$$

5. Graph the following system of equations and state its solution as a coordinate pair. Check the solution.

$$\begin{cases} x + 2y = 6 \\ y = -\frac{1}{2}x + 2 \end{cases} \rightarrow \begin{cases} -x + 2y = 6 \\ -x + 2y = -x \end{cases}$$

$$m = \frac{-1 \downarrow}{2 \rightarrow}$$

$$b = 2$$

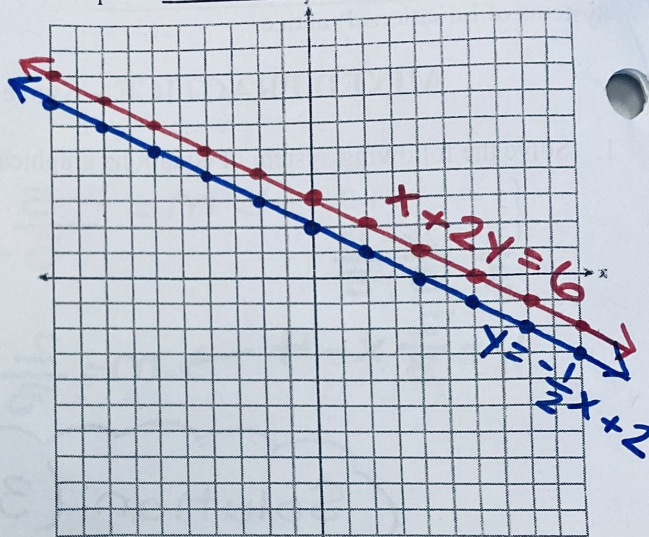
$$\frac{2y}{2} = \frac{-x + 6}{2}$$

$$y = -\frac{1}{2}x + 3$$

$$m = \frac{-1 \downarrow}{2 \rightarrow}$$

$$b = 3$$

No Solution



6. Solve the following system of equations algebraically and check.

$$\begin{cases} x - \frac{1}{2}y = 4 \\ x - y = 7 \end{cases} \rightarrow \begin{cases} x - \frac{1}{2}y = 4 \\ -x + y = -7 \end{cases}$$

$$\frac{1}{2}y = -3 \quad (2)$$

$$y = -6$$

$$\begin{aligned} x - (-6) &= 7 \\ x + 6 &= 7 \\ \underline{-6} \quad \underline{-6} \\ x &= 1 \end{aligned}$$

Check:

$$\begin{aligned} (1) -(-6) &= 7 \\ 1 + 6 &= 7 \\ 7 &= 7 \checkmark \\ (1) - \frac{1}{2}(-6) &= 4 \\ 1 + 3 &= 4 \\ 4 &= 4 \checkmark \end{aligned}$$

7. Which coordinate is the point of intersection for the following system of equations?

$$\begin{cases} 2x + y = 7 \\ x - 2y = 6 \end{cases}$$

- (1) (3, 1)
- (2) (1, 3)
- (3) (-1, 4)
- (4) (4, -1)

$$\begin{aligned} 2(2x + y) &= 14 \\ + 4x + 2y &= 14 \\ + x - 2y &= 6 \\ \hline 5x &= 20 \\ \frac{5x}{5} &= \frac{20}{5} \\ x &= 4 \end{aligned}$$

8. Solve the following system of equations algebraically and check.

$$\begin{cases} 3x + y = 3 \\ y = 2x - 7 \end{cases}$$

$$3x + (2x - 7) = 3$$

$$5x - 7 = 3$$

$$\frac{5x}{5} = \frac{10}{5} \quad x = 2$$

$$\begin{aligned} y &= 2(2) - 7 \\ y &= 4 - 7 \\ y &= -3 \end{aligned}$$

Solution (2, -3)

9. Which system has the same solution as the system: $\begin{cases} 2x + 2y = 16 \\ 3x - y = 4 \end{cases}$

(1) $\begin{cases} 2x + 2y = 16 \\ 6x - 2y = 4 \end{cases}$

(3) $\begin{cases} x + y = 16 \\ 3x - y = 4 \end{cases}$

(2) $\begin{cases} 2x + 2y = 16 \\ 6x - 2y = 8 \end{cases}$

(4) $\begin{cases} 6x + 6y = 48 \\ 6x + 2y = 8 \end{cases}$