

Systems of Linear Equations Packet

Multiple Choice

Identify the choice that best completes the statement or answers the question.

a

1. Solve the system of equations.

$$\begin{aligned} 4x + 3y &= 16 \\ x &= -3y + 13 \end{aligned}$$

substitution

$$\begin{aligned} 4(-3y + 13) + 3y &= 16 \\ -12y + 52 + 3y &= 16 \end{aligned}$$

$$-9y + 52 = 16$$

$$\begin{array}{r} -52 \quad -52 \\ \hline \end{array}$$

$$-9y = -36$$

$$y = 4$$

a. (1,4)

b. (-1,4)

c

2. Solve the system of equations.

$$\begin{array}{r} x + y = -3 \\ + \quad x - y = -5 \\ \hline 2x = -8 \end{array}$$

$$x = -4$$

y's are already OPPOSITES!



a. (4,2)

c. (-4,1)

b. (-5,2)

d. (-5,4)

d

3. Franco is solving a system of linear equations algebraically. He find that there are an infinite number of solutions. Which is a possible step in his solution?

a. $5 = 5 + 1$

b. $-5 = 5$

c. $11 = 5$

d. $5 = 5$

only true statement

True statement left over

b

4. Giovanni solves a system of equations algebraically. He concludes that the lines are parallel. Which could be the final line of his solution?

a. $-5 = -5$

b. $-5 = -5 + 1$

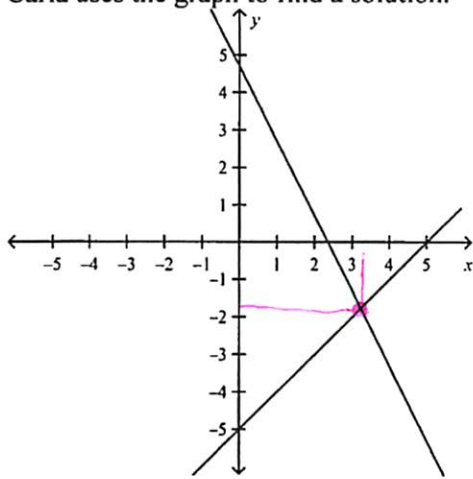
c. $11 = 11$

d. $5 = 5$

No Solution

False statement

- c** 5. Carla uses the graph to find a solution.



Explain why the solution is an estimate.

- a. The lines do not intersect.
- b. Neither graph goes through the origin, so there is no solution.
- c.** The coordinates of the solution are not whole numbers.
- d. The accuracy is limited because the x-axis and y-axis both extend only from -5 to 5.

- c** 6. Chloe, Tarina, and Lizette solved the system of equations shown.

$$\frac{2}{3}x + 3y = 26$$

$$2x + \frac{1}{2}y = 27$$

$$\begin{matrix} x & y \\ (12, 6) & \end{matrix} \quad \begin{matrix} x=12 \\ y=6 \end{matrix}$$

$$\begin{aligned} 2(12) + \frac{1}{2}(6) &= 27 \\ 24 + 3 &= 27 \\ 27 &= 27 \end{aligned} \quad \left. \begin{aligned} \frac{2}{3}(12) + 3(6) &= 26 \\ 8 + 18 &= 26 \\ 26 &= 26 \end{aligned} \right\}$$

Chloe claims the solution is (3, 8). Tarina claims the solution is (-6, 10). Lizette claims the solution is (12, 6). Which statement is true?

- a. Chloe's solution is correct.
- b. Tarina's solution is correct.
- c.** Lizette's solution is correct.
- d. None of the solutions are correct.

- b** 7. Which system of linear equations has no solution?

a. $x + y = 9$

$x - y = 3$

b. $-5x = 9 - y$

$-5x + y = 3$

c. $2x + y = 4$

$x - 3y = 9$

d. $4x + 3y = 5$

$3x - 2y = 14$

$$\begin{aligned} -5x + y &= 9 \\ -5x + y &= 3 \end{aligned}$$

Same different

← 2 Impossible → No solution

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Addition!

d

8. What is the solution of the linear system?

$$\begin{array}{r} 2(3x - 2y = 1) \\ -x + 4y = -27 \end{array}$$

$$\begin{array}{r} 6x - 4y = 2 \\ + \quad -1x + 4y = -27 \\ \hline 5x = -25 \end{array}$$

$$\frac{5x = -25}{5} = \frac{-25}{5}$$

$$x = -5$$

a. $(-9, -9)$

c. $(-13, -10)$

b. $(-7, -10)$

d. $(-5, -8)$

c

9. How can you tell if an ordered pair is a solution of a system of linear equations by examining the graphs of the equations?

a. Neither line passes through the point represented by the ordered pair.

b. Just one of the lines passes through the point represented by the ordered pair.

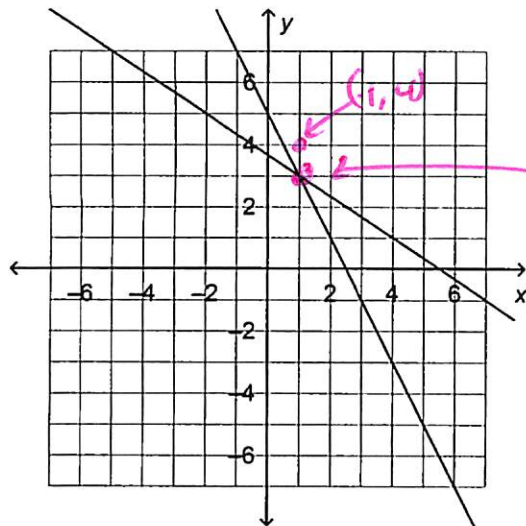
c. Both lines pass through the point represented by the ordered pair.

d. You cannot tell whether an ordered pair is a solution of a system of linear equations by examining the graphs of the equations.

Point of intersection (SOLUTION)

d

10. Is the ordered pair $(1, 4)$ a solution of the system of equations whose graph is shown? Explain.



No! (1, 3)

a. Yes, because the lines intersect at the point $(1, 4)$.

b. Yes, because one line passes through the point $(1, 4)$.

c. No, because just one line passes through the point $(1, 4)$.

d. No, because neither line passes through the point $(1, 4)$.

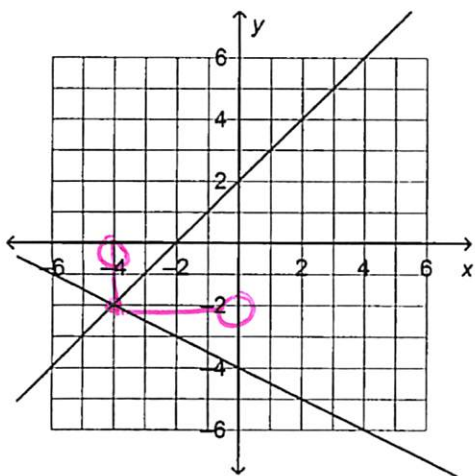
Plug in -5 for x
 3 for y

C 11. Does the ordered pair $(-5, 3)$ satisfy the system of equations? Explain.

$$\begin{cases} y = -2x - 1 & \text{X} \\ y = -\frac{3}{5}x & \text{✓} \end{cases} \quad \begin{array}{l} 3 = -2(-5) - 1 \rightarrow 3 = 10 - 1 \rightarrow 3 \neq 9 \\ 3 = \left(-\frac{3}{5}\right)(-5) \rightarrow 3 = \frac{15}{5} \Rightarrow 3 = 3 \end{array}$$

- a. Yes, because the ordered pair $(-5, 3)$ satisfies both equations of the system.
 b. No, because the ordered pair $(-5, 3)$ satisfies only the equation $y = -2x - 1$.
c. No, because the ordered pair $(-5, 3)$ satisfies only the equation $y = -\frac{3}{5}x$.
 d. No, because the ordered pair $(-5, 3)$ satisfies neither equation of the system.

a 12. Which ordered pair is the solution of the system of linear equations?



$(-4, -2)$

- a. $(-4, -2)$
 b. $(-4, 2)$
 c. $(-2, -4)$
 d. $(2, 4)$

a 13. What solution(s) does the system of equations have?

$$\begin{cases} -2x + 5y = 10 \\ -4x + 10y = 20 \end{cases}$$

- a. There are infinitely many solutions.
 b. The only solution is $(5, 4)$.
 c. The only solution is $(10, 6)$.
 d. There are no solutions.

Because the bottom equation is $\times 2$ the top, the equations are the same.

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* use a graph for this one!

d

17. The line that passes through the points $(-5, -6)$ and $(-3, 2)$ and the line $y = x - 4$ intersect at what point?

- a. $(-5, -6)$
- b. $(2, -2)$
- c. $(-3, 2)$
- d. $(-6, -10)$

x	y
-5	-6
-3	2

$$m = \frac{\Delta y}{\Delta x} = \frac{8}{2} = 4$$

$$y = mx + b$$

$$2 = (4)(-3) + b \rightarrow b = 14$$

$$y = x - 4$$

$$y = 4x + 14$$

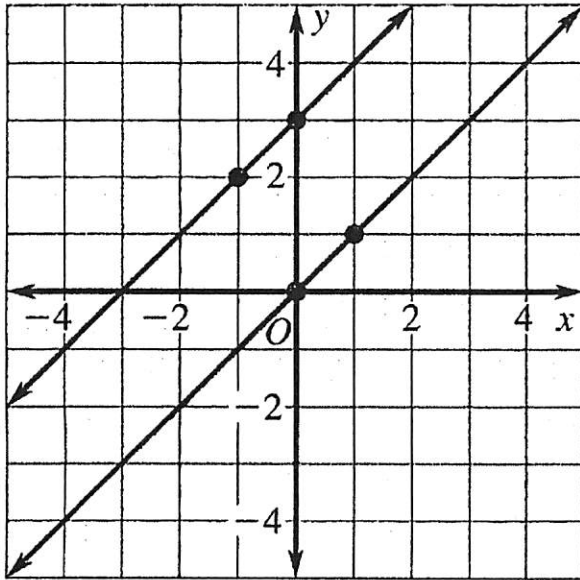
$$x - 4 = 4x + 14$$

$$\frac{-18}{3} = \frac{3x}{3}$$

$$-6 = x$$

Short Answer: Write your answer

1. The graph of a system of linear equations is shown. Write the solution of the system.



No solution

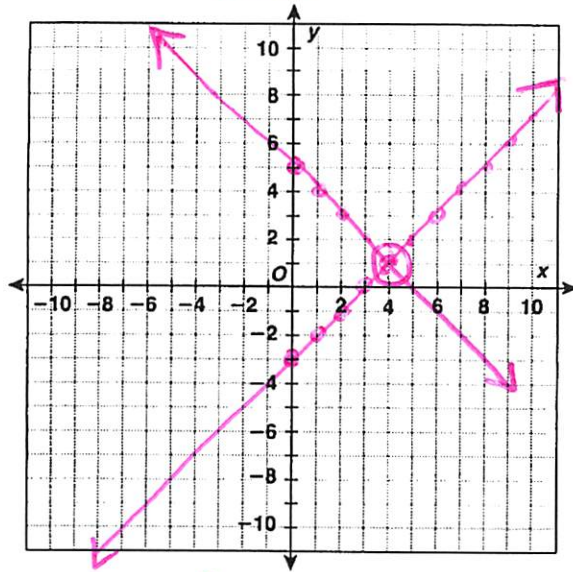
because \rightarrow The lines have the same slopes but different y-int. \rightarrow Parallel lines do NOT intersect

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2. Solve $\begin{cases} y = x - 3 \\ y = -x + 5 \end{cases}$ by graphing.

$m = \frac{1}{1} \rightarrow, b = -3$
 $m = -\frac{1}{1} \rightarrow, b = 5$

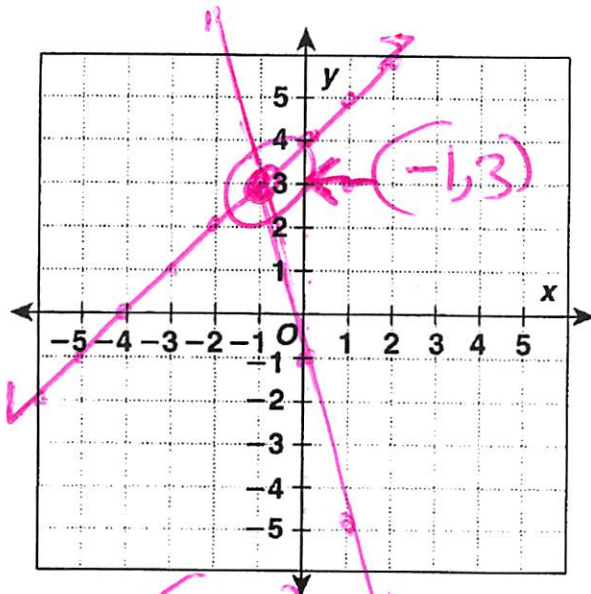


$(4, 1)$

Solution $(4, 1)$

3. Solve $\begin{cases} 4x + y = -1 \\ y - 4 = x \end{cases}$ by graphing.

$y = -4x - 1$
 $y = x + 4$



Solution $(-1, 3)$

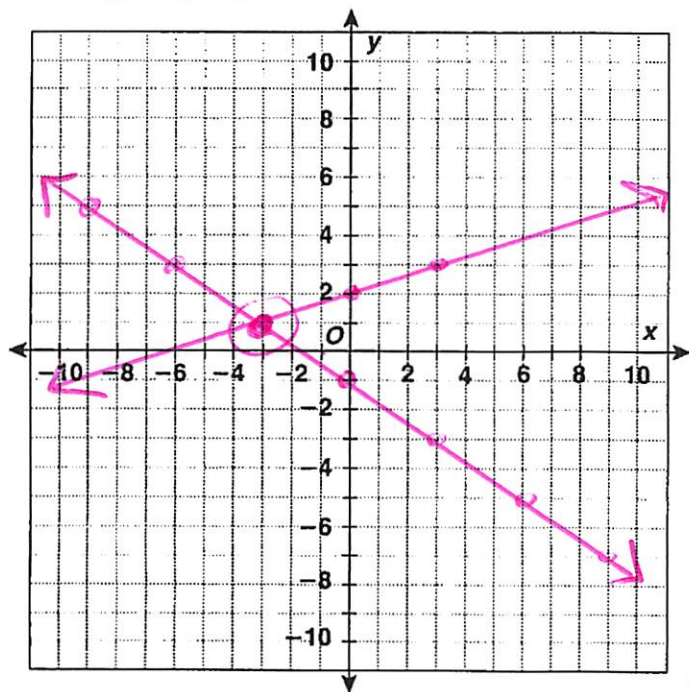
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4. Solve $\begin{cases} y - 2 = \frac{1}{3}x \\ 3y = -2x - 3 \end{cases}$ by graphing.

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

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



Solution $(-3, 1)$

5. Solve the system of equations.

$$\begin{cases} y = 2x + 5 \\ y = 3x + 4 \end{cases}$$

Substitute $(2x + 5)$ for y

$$2x + 5 = 3x + 4$$

$$1 = x$$

Solution: $(1, 7)$

$$y = 7$$

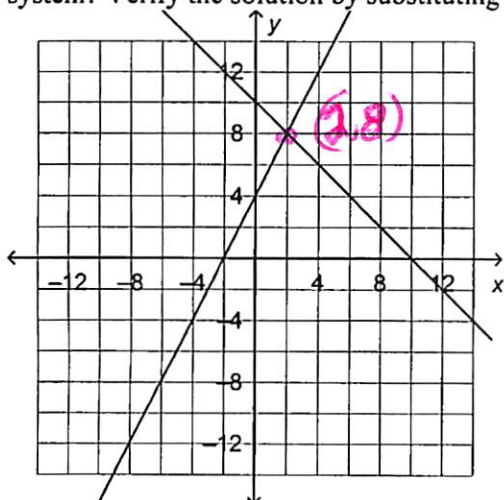
6. Solve the system using any algebraic method.

$$\begin{array}{r} x - y = -5 \\ x + y = 11 \\ \hline 2x = 6 \\ x = 3 \end{array}$$

y terms are already opposite

Solution (3, 8)

7. The graph of the system of linear equations $x + y = 10$ and $-2x + y = 4$ is shown. What is the solution of the system? Verify the solution by substituting it into each equation.



(2, 8)

$$\begin{array}{l} x = 2 \\ y = 8 \end{array}$$

$$\begin{array}{l} x + y = 10 \\ 2 + 8 = 10 \end{array}$$

$$-2x + y = 4$$

$$10 = 10$$

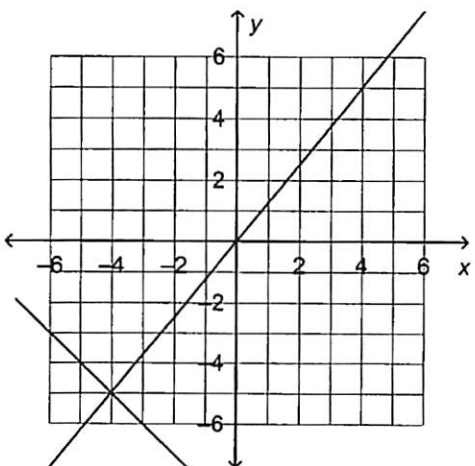
$$-2(2) + 8 = 4$$

$$-4 + 8 = 4$$

$$4 = 4$$



8. Is the ordered pair $(-5, -4)$ a solution of the system of linear equations whose graph is shown? Explain your reasoning.



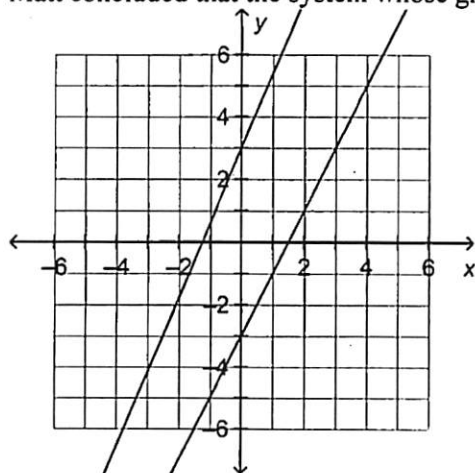
No.

(-4, -5)

The coordinates are in the wrong order.

(x, y)

9. Matt concluded that the system whose graph is shown has no solution. Is he correct? Explain your reasoning.



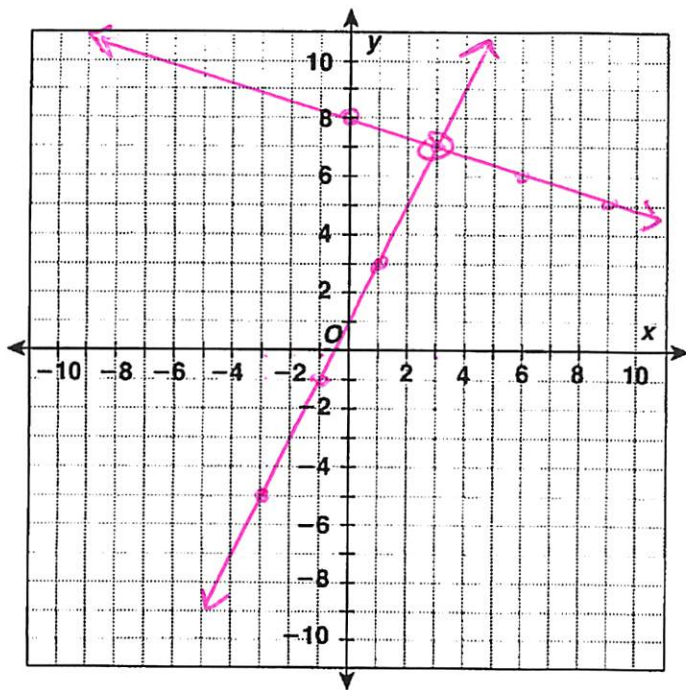
NO. The lines will intersect at some point. B/c they are not parallel. (They have different slopes)
One solution exists.

10. Solve the system of equations by examining the equations. Explain your reasoning.

$$\begin{cases} -2x + 4y = 5 \\ -2x + 4y = 6 \end{cases}$$

NO solution. It is impossible $-2x + 4y = 5$ and $-2x + 4y = 6$ at the same time.

11. A line has a slope of $-\frac{1}{3}$ and a y -intercept of 8. Another line passes through the points $(-3, -5)$ and $(1, 3)$. Find the equations of the lines, and then determine the point where the lines intersect.



$$y = -\frac{1}{3}x + 8$$

$$(3, 7)$$

$$y = 2x + 1$$