

5.1 Systems of Equations Homework

Solve by Graphing

What does it mean to solve a system of equations?

(What is a solution for a system?) When you solve a system you find the ordered pair (x, y) that represents the point where the two lines intersect.

You graph a system of linear equations, and the solution appears to be $(3, 4)$. How can you verify that the solution is $(3, 4)$?

(Suppose the equations are $y = 2x - 2$ and $y = 5x - 11$) You check by substituting the x & y coordinates $(3, 4)$ in each equation and making sure the point is a solution for each.

$$\begin{aligned} \textcircled{1} \quad 4 &= 2(3) - 2 \\ 4 &= 6 - 2 \\ 4 &= 4 \quad \checkmark \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad 4 &= 5(3) - 11 \\ 4 &= 15 - 11 \\ 4 &= 4 \quad \checkmark \end{aligned}$$

Use a table to find the break-even point. Check your solution.

$$C = 24x + 80$$

$$R = 44x$$

x	0	1	2	3	4	5	6	7
C	80	104	128	152	176	200	224	248
R	0	44	88	132	176	220	264	308

Solution
 (x, y)
 $(4, 176)$

$$C = 15x + 150$$

$$R = 45x$$

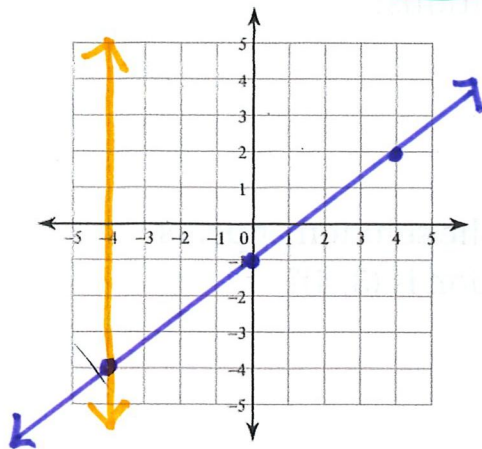
x	0	1	2	3	4	5	6	7
C	150	165	180	195	210	225	240	255
R	0	45	90	135	180	225	270	315

Solution
 (x, y)
 $(5, 225)$

Solve each system by graphing.

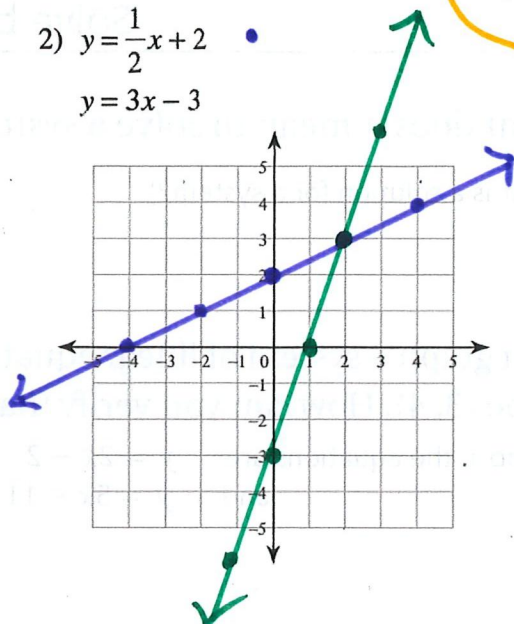
1) $y = \frac{3}{4}x - 1$ ●
 $x = -4$ ●

Solution
 $(-4, -4)$



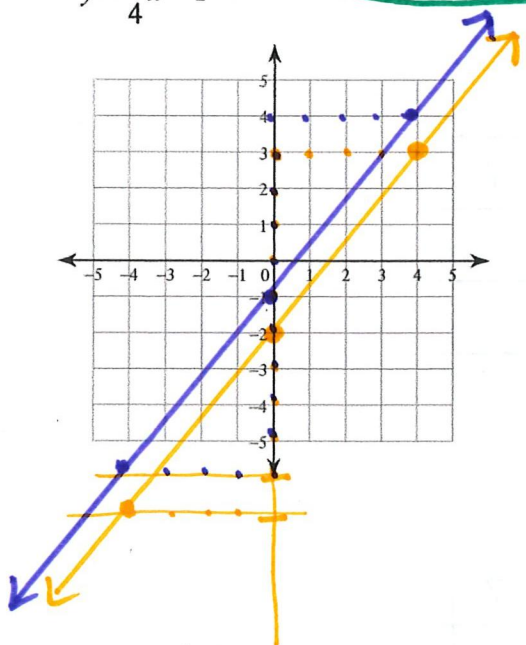
2) $y = \frac{1}{2}x + 2$ ●
 $y = 3x - 3$

Solution
 $(2, 3)$



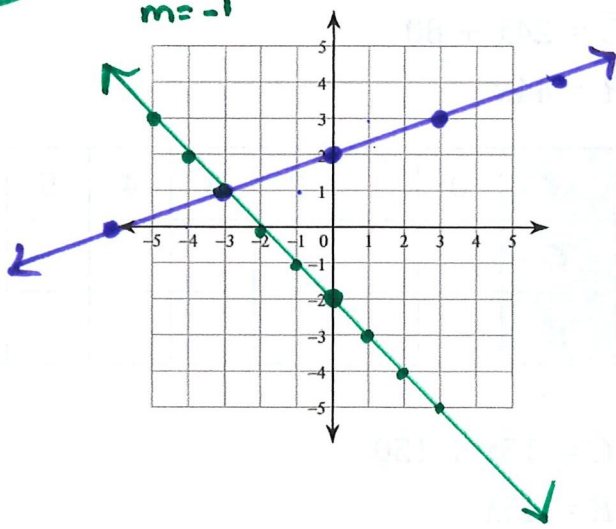
3) $y = \frac{5}{4}x - 2$ ●
 $y = \frac{5}{4}x - 1$ ●

They don't cross!
 Parallel lines
 (same slope)



4) $y = \frac{1}{3}x + 2$ ●
 $y = -x - 2$ ●
 $m = -1$

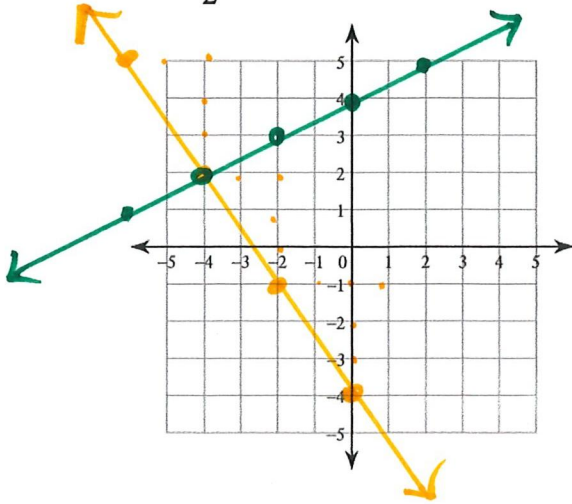
Solution
 $(-3, 1)$



$$5) y = -\frac{3}{2}x - 4$$

$$y = \frac{1}{2}x + 4$$

Solution
(-4, 2)

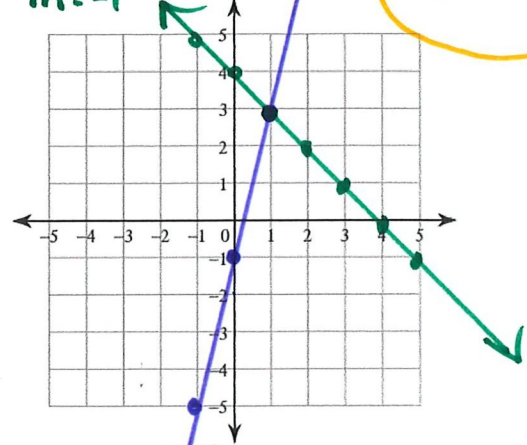


$$6) y = 4x - 1$$

$$y = -x + 4$$

m = -1

Solution
(1, 3)



Match the system of linear equations with the corresponding graph. Use the graph to estimate the solution. Check your solution.

$$7. y = 1.5x - 2$$

$$y = -x + 13$$

B

$$8. y = x + 4$$

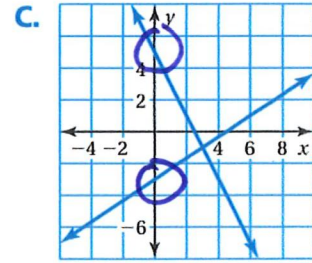
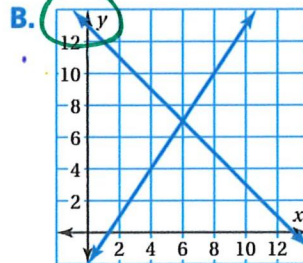
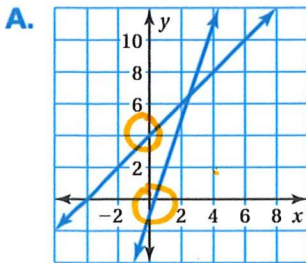
$$y = 3x - 1$$

A

$$9. y = \frac{2}{3}x - 3$$

$$y = -2x + 5$$

C



* Graph Intervals Counting by 2's

Use a graphing calculator to solve the system of linear equations.

$$1) y = 6x - 11$$

$$-2x - 3y = -7$$

(2, 1)

$$2) 2x - 3y = -1$$

$$y = x - 1$$

(2, 1)

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

$$5x - 4y = -3$$

(1, 2)

$$4) -3x - 3y = 3$$

$$y = -5x - 17$$

(-4, 3)

Lesson 5.2 Substitution Strategy

Date _____ Period _____

Solve each system by substitution.

$$1) \begin{aligned} y &= -4x - 4 \\ y &= -8x \end{aligned} \quad y=y$$

$$\begin{array}{r} -4x - 4 = -8x \\ +4x \quad \quad +4x \\ \hline -4 = -4x \\ -4 \quad -4 \\ \hline 1 = x \end{array}$$

$$\begin{aligned} y &= -8x \\ y &= -8(1) \\ y &= -8 \end{aligned}$$

$$(1, -8)$$

$$3) \begin{aligned} y &= 2x - 1 \\ y &= x + 3 \end{aligned} \quad y=y$$

$$\begin{array}{r} 2x - 1 = x + 3 \\ -x \quad \quad -x \\ \hline 1x - 1 = 3 \\ +1 \quad +1 \\ \hline x = 4 \end{array}$$

$$\begin{aligned} y &= x + 3 \\ y &= 4 + 3 \\ y &= 7 \end{aligned}$$

$$(4, 7)$$

$$2) \begin{aligned} y &= x + 6 \\ y &= -8x + 6 \end{aligned} \quad y=y$$

$$\begin{array}{r} x + 6 = -8x + 6 \\ +8x \quad \quad +8x \\ \hline 9x + 6 = 6 \\ -6 \quad -6 \\ \hline 9x = 0 \\ \frac{9x}{9} = \frac{0}{9} \\ x = 0 \end{array}$$

$$\begin{aligned} y &= x + 6 \\ y &= 0 + 6 \\ y &= 6 \end{aligned}$$

$$(0, 6)$$

$$4) \begin{aligned} y &= 6x + 10 \\ y &= 5x + 9 \end{aligned} \quad y=y$$

$$\begin{array}{r} 6x + 10 = 5x + 9 \\ -5x \quad \quad -5x \\ \hline 1x + 10 = 9 \\ -10 \quad -10 \\ \hline x = -1 \end{array}$$

$$\begin{aligned} y &= 6x + 10 \\ y &= 6(-1) + 10 \\ y &= -6 + 10 \\ y &= 4 \end{aligned}$$

$$(-1, 4)$$

9) $-4x + 2y = 10$

$x - 4y = 8$

Easiest to solve for "x"

$x - 4y = 8$
 $+4y +4y$

$x = 4y + 8$

Substitute into 1st Eq.

$-4x + 2y = 10$

$-4(4y + 8) + 2y = 10$

$-16y - 32 + 2y = 10$

$-14y - 32 = 10$
 $+32 +32$

$-14y = 42$
 $-14 -14$

$y = -3$

$x - 4y = 8$

$x - 4(-3) = 8$

$x + 12 = 8$
 $-12 -12$

$x = -4$

$(-4, -3)$

Easiest solve for "y"

10) $6x + y = -24$

$4x - 4y = 12$

$6x + y = -24$
 $-6x -6x$

$y = -6x - 24$

Substitute into 2nd Eq

$4x - 4y = 12$

$4x - 4(-6x - 24) = 12$

$4x + 24x + 96 = 12$

$28x + 96 = 12$
 $-96 -96$

$28x = -84$
 $28 28$

$x = -3$

$(-3, -6)$

$6x + y = -24$

$6(-3) + y = -24$

$-18 + y = -24$
 $+18 +18$

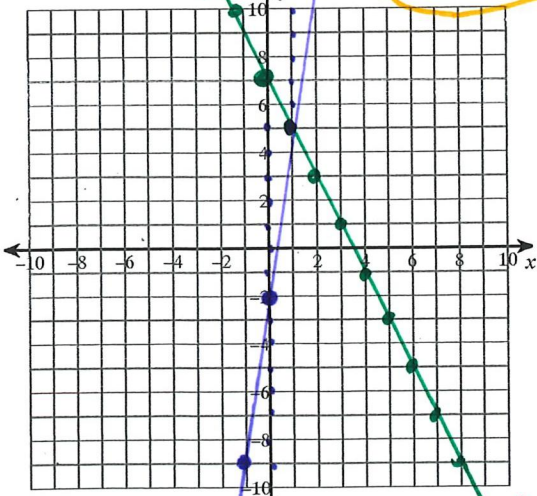
$y = -6$

Solve each system by graphing.

11) $y = -2x + 7$

$y = 7x - 2$

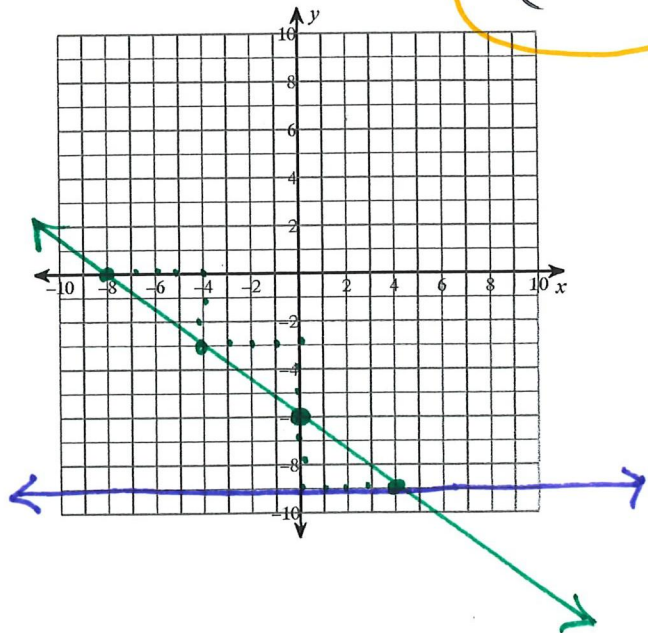
$(1, 5)$



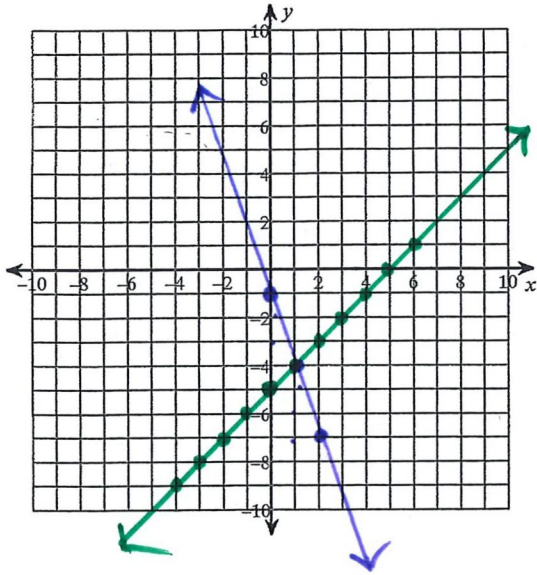
12) $y = -\frac{3}{4}x - 6$

$y = -9$

$(4, -9)$

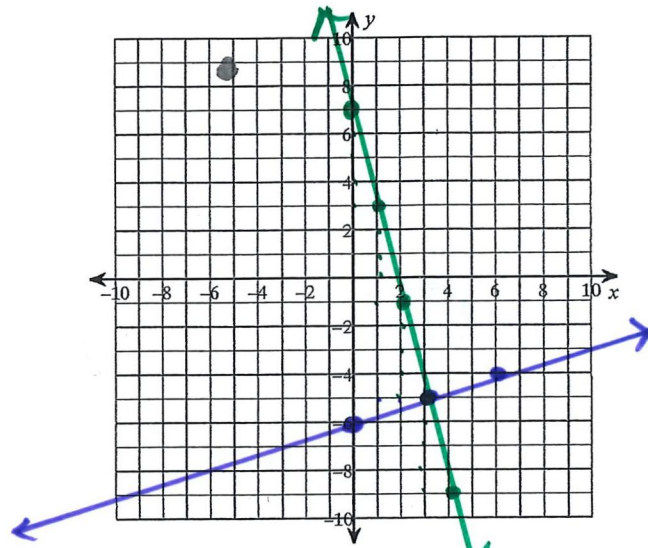


13) $y = x - 5$ ●
 $y = -3x - 1$ ●



Solution (1, -4)

14) $y = -4x + 7$ ●
 $y = \frac{1}{3}x - 6$ ●



Solution (3, -5)

Answers to Lesson 5.2 Substitution Strategy (ID: 1)

- 1) (1, -8)
- 5) (-1, -6)
- 9) (-4, -3)
- 13) (1, -4)

- 2) (0, 6)
- 6) (-6, 3)
- 10) (-3, -6)
- 14) (3, -5)

- 3) (4, 7)
- 7) (1, 1)
- 11) (1, 5)

- 4) (-1, 4)
- 8) (1, 4)
- 12) (4, -9)