

Sections 3.1 through 3.2 Test Review

Name: Completed

3-1A Solving Systems with Graphing

- 1) Determine if $(-3, -1)$ is a solution for the system of equations.

$$\begin{aligned} -2x - 3y &= 9 & -2(-3) - 3(-1) &= 9 \\ 4x + 6y &= -18 & 6 + 3 &= 9 \\ & & 9 &= 9 \\ & & & \checkmark \end{aligned}$$

$$\begin{aligned} 4(-3) + 6(-1) &= -18 \\ -12 - 6 &= -18 \\ -18 &= -18 \checkmark \end{aligned}$$

yes!

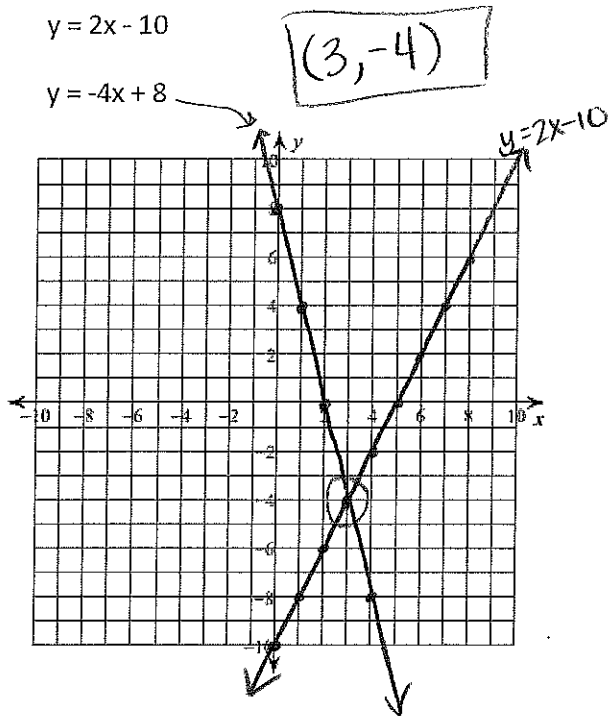
- 2) Determine if $(3, 8)$ is a solution for the system of equations.

$$\begin{aligned} 9x - 2y &= 11 & 9(3) - 2(8) &= 11 \\ 5x + 4y &= 13 & 27 - 16 &= 11 \\ & & 11 &= 11 \checkmark \end{aligned}$$

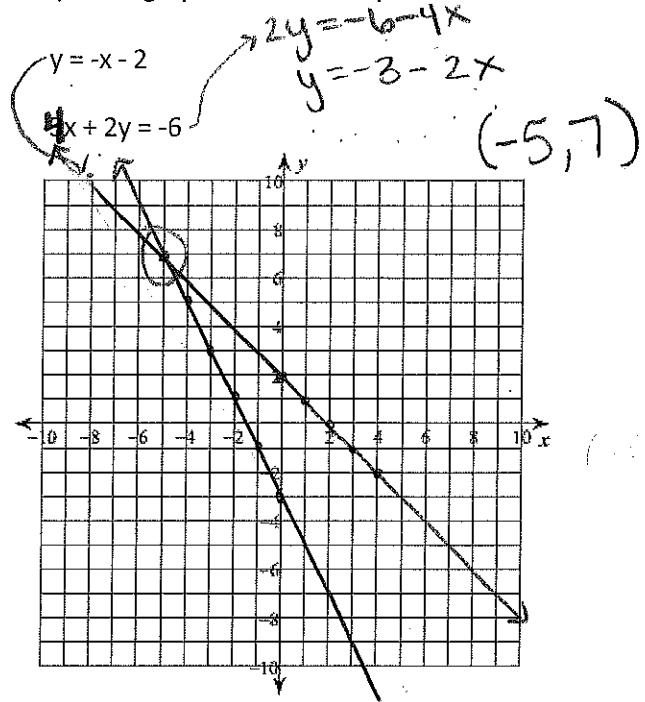
$$\begin{aligned} 5(3) + 4(8) &= 13 \\ 15 + 32 &= 13 \\ 47 &\neq 13 \end{aligned}$$

no!

- 3) Use a graph to solve the system.



- 4) Use a graph to solve the system.



- 5) Determine the number of solutions of

$$\begin{aligned} y + 4x &= 12 & y &= -4x + 12 \\ 3y &= 8 - 12x & y &= \frac{8}{3} - 4x \end{aligned}$$

Same slope / parallel lines
diff yint!

no solution

- 6) Determine the number of solutions of

$$\begin{aligned} 2x + 5y &= 10 & \rightarrow 5y &= 10 - 2x \\ & & y &= 2 - \frac{2}{5}x \\ -4x - 10y &= -20 & \rightarrow -10y &= -20 + 4x \\ & & y &= 2 - \frac{4}{10}x \\ & & y &= 2 - \frac{2}{5}x \end{aligned}$$

Same slope / Same yint!
Same line!

∞ solutions

3-1B Solving Systems with Substitution

7) Use substitution to solve the system.

$$\begin{aligned}
 y &= \boxed{-x-4} \\
 -9x - 4y &= 31 \\
 -9x - 4(-x-4) &= 31 \\
 -9x + 4x + 16 &= 31 \\
 -5x + 16 &= 31 \\
 -5x &= 15 \\
 x &= -3 \rightarrow y = -(-3) - 4 \\
 & \qquad \qquad \qquad y = -7 \\
 \boxed{(3, -7)}
 \end{aligned}$$

8) Use substitution to solve the system.

$$\begin{aligned}
 2x + y &= -2 \rightarrow y = \boxed{-2-2x} \\
 x - 3y &= -22 \\
 x - 3(-2-2x) &= -22 \\
 x + 6 + 6x &= -22 \\
 7x &= -28 \\
 x &= -4 \rightarrow y = -2 - 2(-4) \\
 & \qquad \qquad \qquad y = -2 + 8 \\
 & \qquad \qquad \qquad y = 6 \\
 \boxed{(-4, 6)}
 \end{aligned}$$

3-1C Solving Systems using Elimination

9) Solve the system by elimination.

$$\begin{aligned}
 4x - 3y &= 29 \\
 + \quad 4x + 3y &= 35 \\
 \hline
 8x &= 64 \\
 x &= 8 \rightarrow 4(8) + 3y = 35 \\
 & \qquad \qquad \qquad 32 + 3y = 35 \\
 & \qquad \qquad \qquad 3y = 3 \\
 & \qquad \qquad \qquad y &= 1 \\
 \boxed{(8, 1)}
 \end{aligned}$$

10) Solve the system by elimination.

$$\begin{aligned}
 -35x + 40y &= 55 \\
 7x - 8y &= -11 \quad \times(5) \\
 \hline
 -35x + 40y &= 55 \\
 35x - 40y &= -55 \\
 \hline
 0 &= 0 \\
 & \text{true!} \\
 \boxed{\infty \text{ solutions}}
 \end{aligned}$$

11) Solve the system by any method.

$$\begin{aligned}
 4x + 3y &= 2 \\
 4x - 2y &= 12 \quad \times(-1) \rightarrow -4x + 2y = -12 \\
 \hline
 & \qquad \qquad \qquad 5y = -10 \\
 & \qquad \qquad \qquad y = -2 \\
 4x + 3(-2) &= 2 \leftarrow \\
 4x - 6 &= 2 \\
 4x &= 8 \\
 x &= 2 \\
 \boxed{(2, -2)}
 \end{aligned}$$

12) Solve the system by any method.

$$\begin{aligned}
 8x - 5y &= -60 \quad \times(3) \rightarrow 24x - 15y = -180 \\
 6x + 3y &= -18 \quad \times(5) \rightarrow 30x + 15y = -90 \\
 \hline
 54x &= -270 \\
 x &= -5 \\
 8(-5) - 5y &= -60 \leftarrow \\
 -40 - 5y &= -60 \\
 -5y &= -20 \\
 y &= 4 \\
 \boxed{(-5, 4)}
 \end{aligned}$$

3-1D Applications of Systems

13) Elena rented a raft from River Rafter's Inc. She paid \$100 to rent the raft and \$25 an hour for a guide. Martin rented a raft from Oscar's Outdoor Shop. He paid \$50 to rent the raft and \$35 per hour for a guide. For what number of hours will both rafting companies charge the same amount? What amount will they charge?

$x = \# \text{ of hours}$
 $y = \text{total cost}$
 R.R. $\rightarrow y = 100 + 25x$
 O.O. $\rightarrow y = 50 + 35x$

$$100 + 25x = 50 + 35x$$

$$50 = 10x$$

$$5 = x$$

$$y = 100 + 25(5)$$

$$= 100 + 125$$

$$= 225$$

5 hours & they both cost \$225

14) At a park there are 38 people playing tennis. Some are playing doubles, and some are playing singles. There are 13 matches in progress. A doubles match requires 4 players, and a singles match requires 2 players.

a) Write a system of equations that represents the number of singles and doubles matches going on.

$d = \# \text{ of doubles matches played}$
 $g = \# \text{ of singles matches played}$

$$d + g = 13$$

$$4d + 2g = 38$$

$$\begin{array}{r} d + g = 13 \quad \times(-2) \rightarrow -2d - 2g = -26 \\ 4d + 2g = 38 \\ \hline 2d = 12 \end{array}$$

b) how many matches of each kind are in progress?

6 doubles matches and 7 singles matches

$$d = 6$$

$$6 + g = 13$$

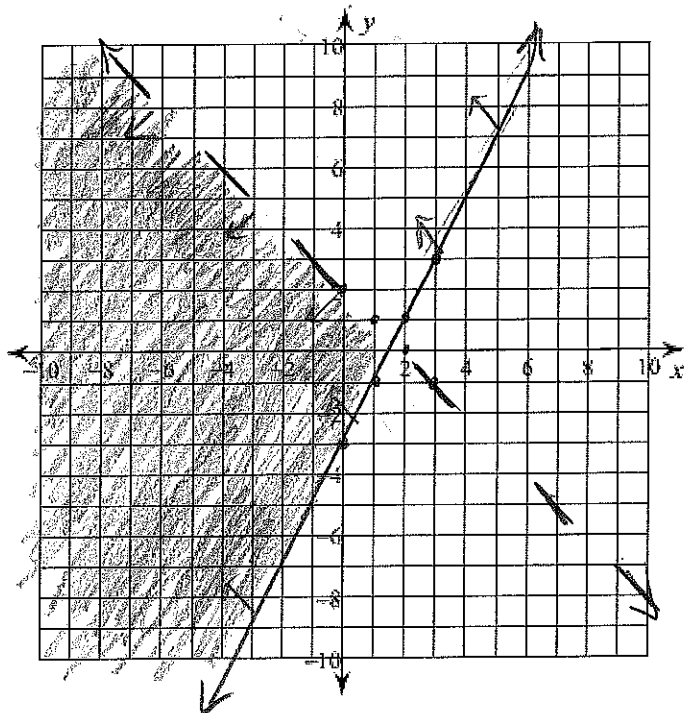
$$g = 7$$

3-2 Graphing systems of Inequalities

15) Solve the system of Inequalities by Graphing:

$$y \geq 2x - 3$$

$$y < -x + 2$$

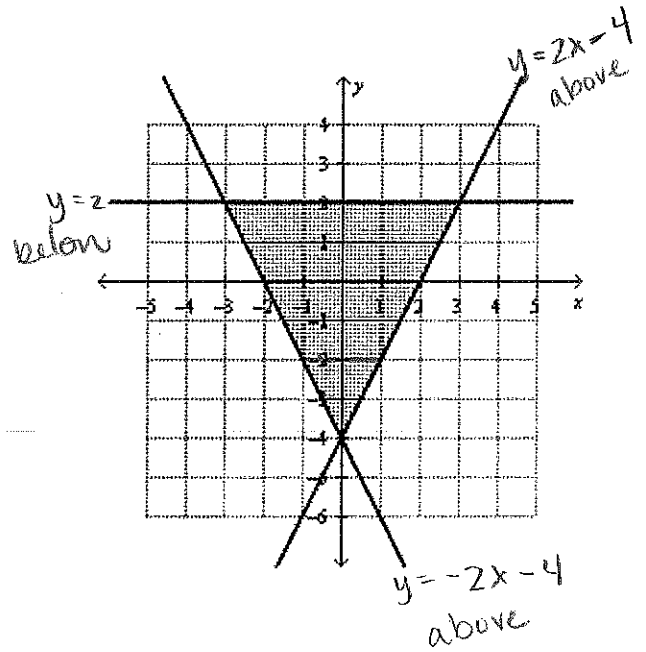


16) Write the system of inequalities shown in the graph.

$$y \leq 2$$

$$y \geq 2x - 4$$

$$y \geq -2x - 4$$



17) Graph the system of Inequalities. Name the coordinates of the vertices of the feasible region.

$$y \geq 3$$

$$y \leq 6$$

$$y \leq 3x + 10$$

$$y \leq -2x + 8$$

Vertices: $(-1.333, 6)$

$(1, 6)$

$(-2.333, 4)$

$(2.5, 3)$

