

5.1 Notetaking with Vocabulary

- I can check solutions of linear equations.
- I can solve linear systems by graphing.
- I can use systems of linear equations to solve real-life problems.

Write the meaning of each vocabulary term.

system of linear equations - a set of 2 or more linear equations

Ex. $x + y = 7$ in the same variables
 $2x - 3y = -11$

solution of a system of linear equations - an ordered pair that is a solution to all equations in the system.

Ex. the solution to above is: $(2, 5)$

In Exercises 1-4, tell whether the ordered pair is a solution of the system of linear equations.

1. $(3, 1); x + y = 4$
 $2x - y = 3$

$3 + 1 \stackrel{?}{=} 4$
 $4 = 4 \checkmark$

$(3, 1)$ is not a solution.

$2(3) - 1 \stackrel{?}{=} 3$
 $6 - 1 \stackrel{?}{=} 3$
 $5 \neq 3 \times$

2. $(1, 3); x - y = -2$
 $2x + y = 5$

$1 - 3 \stackrel{?}{=} -2$
 $-2 = -2 \checkmark$

$2(1) + 3 \stackrel{?}{=} 5$
 $5 = 5 \checkmark$

$(1, 3)$ is a solution to the system.

3. $(2, 0); y = x - 2$
 $y = -3x + 6$

4. $(-2, 3); 3x - 2y = -12$
 $2x + 4y = 9$

5.1 Notetaking with Vocabulary (continued)

Core Concepts

Solving a System of Linear Equations by Graphing

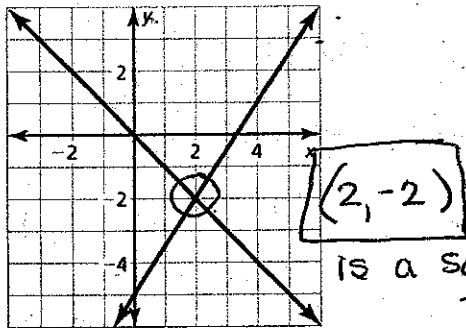
Step 1 Graph each equation in the same coordinate plane.

Step 2 Estimate the point of intersection.

Step 3 Check the point from Step 2 by substituting for x and y in each equation of the original system. *Not optional*

In Exercises 5 and 6, use the graph to solve the system of linear equations. Check your solution.

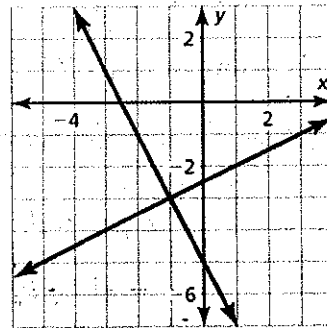
5. $3x - 2y = 10$
 $x + y = 0$



is a solution.

$$\begin{aligned} 3(2) - 2(-2) &\stackrel{?}{=} 10 \\ 6 + 4 &\stackrel{?}{=} 10 \\ 10 &= 10 \checkmark \\ 2 + (-2) &\stackrel{?}{=} 0 \\ 0 &= 0 \checkmark \end{aligned}$$

6. $x - 2y = 5$
 $2x + y = -5$

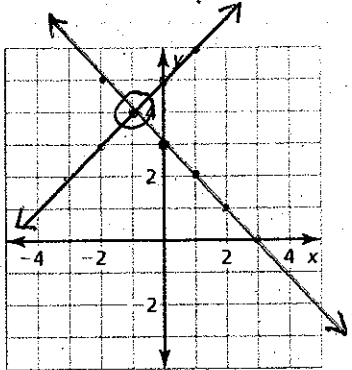


5.1 Notetaking with Vocabulary (continued)

In Exercises 10–15, solve the system of linear equations by graphing. Check your solution. Is C divisible by A+B?

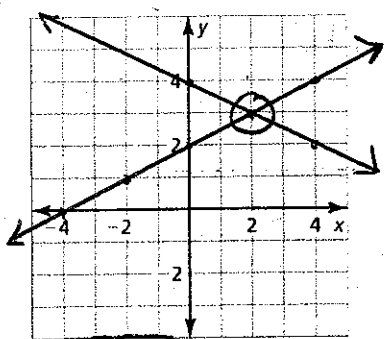
7. $y = -x + 3$
 $y = \frac{1}{2}x + 5$

$(-1, 4)$
 is a solution



$4 \stackrel{?}{=} -(-1) + 3$
 $4 = 1 + 3$
 $4 = 4 \checkmark$
 $4 \stackrel{?}{=} -1 + 5$
 $4 = 4 \checkmark$

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



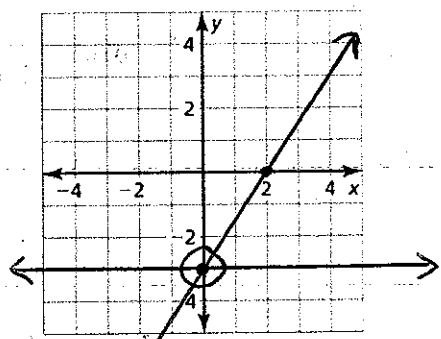
$(2, 3)$ is a solution
 $3 \stackrel{?}{=} \frac{1}{2}(2) + 2$
 $3 = 1 + 2$
 $3 = 3 \checkmark$
 $3 \stackrel{?}{=} -\frac{1}{2}(2) + 4$
 $3 = -1 + 4$
 $3 = 3 \checkmark$

9. $3x - 2y = 6$
 $y = -3$

$\frac{3x}{3} = \frac{6}{3}$
 $x = 2$

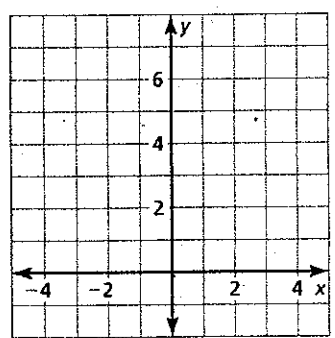
x	y
2	0
0	-3

$-2y = 6$
 $-2 \quad -2$
 $y = -3$

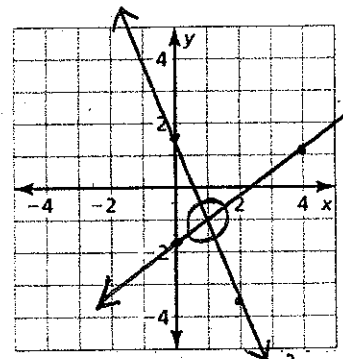


$(0, -3)$ is a solution
 $3(0) - 2(-3) = 6$
 $6 = 6 \checkmark$
 $-3 = -3 \checkmark$

10. $y = 4x + 0$
 $y = -4x + 8$



$5x + 2y = 3$
 $-5x \quad -5x$
 $\frac{2y}{2} = \frac{-5x + 3}{2}$
 $y = -\frac{5}{2}x + \frac{3}{2}$
 $y = -\frac{5}{2}x + 1\frac{1}{2}$



$3(1) - 4(-1) = 7$
 $3 + 4 = 7$
 $7 = 7 \checkmark$
 $5(1) + 2(-1) = 3$
 $5 - 2 = 3$
 $3 = 3 \checkmark$

$3x - 4y = 7$
 $-3x \quad -3x$
 $-4y = -3x + 7$
 $-4 \quad -4 \quad -4$
 $y = \frac{3}{4}x - \frac{7}{4}$
 $= \frac{3}{4}x - 1\frac{3}{4}$

$(1, -1)$
 is a solution.

16. A test has twenty questions worth 100 points. The test consists of x true-false questions worth 4 points each and y multiple choice questions worth 8 points each. How many of each type of question are on the test?

Use a linear system to solve.

$$Ax + By = C \quad \leftarrow \text{total}$$

units = units
same

$$\begin{aligned} x + y &= 20 \\ 4x + 8y &= 100 \end{aligned}$$

$$\frac{0}{8}y = \frac{-4x + 100}{8}$$

$$y = -\frac{1}{2}x + 12\frac{1}{2}$$

$$y = -\frac{1}{2}(3) + 12\frac{1}{2}$$

$$y = -1\frac{1}{2} + 12\frac{1}{2}$$

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

Check ?

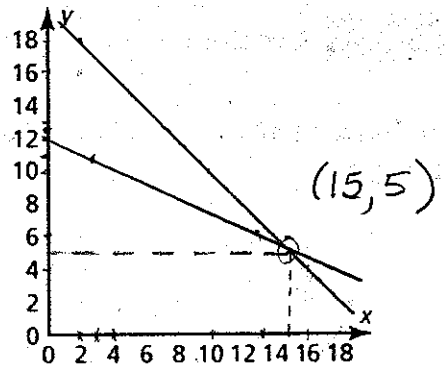
$$15 + 5 = 20$$

$$20 = 20 \quad \checkmark$$

$$4(15) + 8(5) \stackrel{?}{=} 100$$

$$60 + 40 \stackrel{?}{=} 100$$

$$100 = 100 \quad \checkmark$$



$$\begin{aligned} x + y &= 20 \\ y &= -x + 20 \\ y &= -2 + 20 \\ y &= 18 \end{aligned}$$

x	y
2	18
10	10
16	4

x	y
0	12.5
3	11
13	6

$$\begin{array}{r} 12.5 \\ - 1.5 \\ \hline 11 \end{array}$$

There are 15 true/false questions and 5 multiple-choice questions on the test.