

Name:

Algebra Lesson 6.4 Solving Systems of Equations by Multiplication

Complete 1, 3, 11, 13, 15, 19 showing ALL the steps you used to get your answer. Please check the back of the sheet for answers to these problems.

Use elimination to solve each system of equations. (Examples 1-2)

1. $2x - y = 4$
 $7x + 3y = 27$

2. $2x + 7y = 1$
 $x + 5y = 2$

3. $4x + 2y = -14$
 $5x + 3y = -17$

4. $9a - 2b = -8$
 $-7a + 3b = 12$

5. **CCSS | SENSE-MAKING** A kayaking group with a guide travels 16 miles downstream, stops for a meal, and then travels 16 miles upstream. The speed of the current remains constant throughout the trip. Find the speed of the kayak in still water. (Example 3)



6. **PODCASTS** Steve subscribed to 10 podcasts for a total of 340 minutes. He used his two favorite tags, Hobbies and Recreation and Soliloquies. Each of the Hobbies and Recreation episodes lasted about 32 minutes. Each Soliloquies episode lasted 42 minutes. To how many of each tag did Steve subscribe? (Example 3)

Practice and Problem Solving

Use elimination to solve each system of equations. (Examples 1-2)

7. $x + y = 2$
 $-3x + 4y = 15$

8. $x - y = -8$
 $7x + 5y = 16$

9. $x + 5y = 17$
 $-4x + 3y = 24$

10. $6x + y = -39$
 $3x + 2y = -15$

11. $2x + 5y = 11$
 $4x + 3y = 1$

12. $3x - 3y = -6$
 $-5x + 6y = 12$

13. $3x + 4y = 29$
 $6x + 5y = 43$

14. $8x + 3y = 4$
 $-7x + 5y = -34$

15. $8x + 3y = -7$
 $7x + 2y = -3$

16. $4x + 7y = -80$
 $3x + 5y = -58$

19. NUMBER THEORY Seven times a number plus three times another number equals negative one. The sum of the two numbers is negative three. What are the numbers? (Example 3)

Lesson 6.4

1. (3, 2)

3. Eliminate y :

$$\begin{array}{r} (4x + 2y = -14)(-3) \quad -12x - 6y = 42 \\ (5x + 3y = -17)(2) \quad 10x + 6y = -34 \\ \hline -2x \quad \quad \quad = 8 \\ x = -4 \end{array}$$

Now, substitute -4 for x in either equation to find the value of y .

$$\begin{aligned} 4x + 2y &= -14 \\ 4(-4) + 2y &= -14 \\ -16 + 2y &= -14 \\ 2y &= 2 \\ y &= 1 \end{aligned}$$

The solution is $(-4, 1)$.

5. 6 mph 7. $(-1, 3)$ 9. $(-3, 4)$ 11. $(-2, 3)$

13. $(3, 5)$ 15. $(1, -5)$ 17. $(0, 1)$

19. Seven times a number plus three times another number equals -1 .

$$7x + 3y = -1$$

The sum of the two numbers is -3 .

$$\begin{array}{r} x + y = -3 \\ 7x + 3y = -1 \\ (x + y = -3)(-3) \quad -3x - 3y = 9 \\ \hline 4x \quad \quad \quad = 8 \\ x = 2 \end{array}$$

Now, substitute 2 for x in either equation to find y .

$$\begin{aligned} x + y &= -3 \\ 2 + y &= -3 \\ y &= -5 \end{aligned} \quad \text{The two numbers are 2 and } -5.$$

21. $(2.5, 3.25)$ 23. $(3, \frac{1}{2})$ 25a. $240n + 360s =$

3000 25b. $90n + 120s = 1050$ 25c. $(5, 5)$; 5 nurses and 5 support staff were placed.