

7-4

Skills Practice

Elimination Using Multiplication

Use elimination to solve each system of equations.

$$\begin{aligned} 1. \quad x + y &= -9 \\ 5x - 2y &= 32 \quad \mathbf{(2, -11)} \end{aligned}$$

$$\begin{aligned} 2. \quad 3x + 2y &= -9 \\ x - y &= -13 \quad \mathbf{(-7, 6)} \end{aligned}$$

$$\begin{aligned} 3. \quad 2x + 5y &= 3 \\ -x + 3y &= -7 \quad \mathbf{(4, -1)} \end{aligned}$$

$$\begin{aligned} 4. \quad 2x + y &= 3 \\ -4x - 4y &= -8 \quad \mathbf{(1, 1)} \end{aligned}$$

$$\begin{aligned} 5. \quad 4x - 2y &= -14 \\ 3x - y &= -8 \quad \mathbf{(-1, 5)} \end{aligned}$$

$$\begin{aligned} 6. \quad 2x + y &= 0 \\ 5x + 3y &= 2 \quad \mathbf{(-2, 4)} \end{aligned}$$

$$\begin{aligned} 7. \quad 5x + 3y &= -10 \\ 3x + 5y &= -6 \quad \mathbf{(-2, 0)} \end{aligned}$$

$$\begin{aligned} 8. \quad 2x + 3y &= 14 \\ 3x - 4y &= 4 \quad \mathbf{(4, 2)} \end{aligned}$$

$$\begin{aligned} 9. \quad 2x - 3y &= 21 \\ 5x - 2y &= 25 \quad \mathbf{(3, -5)} \end{aligned}$$

$$\begin{aligned} 10. \quad 3x + 2y &= -26 \\ 4x - 5y &= -4 \quad \mathbf{(-6, -4)} \end{aligned}$$

$$\begin{aligned} 11. \quad 3x - 6y &= -3 \\ 2x + 4y &= 30 \quad \mathbf{(7, 4)} \end{aligned}$$

$$\begin{aligned} 12. \quad 5x + 2y &= -3 \\ 3x + 3y &= 9 \quad \mathbf{(-3, 6)} \end{aligned}$$

13. Two times a number plus three times another number equals 13. The sum of the two numbers is 7. What are the numbers? $\mathbf{8, -1}$

14. Four times a number minus twice another number is -16 . The sum of the two numbers is -1 . Find the numbers. $\mathbf{-3, 2}$

Determine the best method to solve each system of equations. Then solve the system.

$$\begin{aligned} 15. \quad 2x + 3y &= 10 \quad \mathbf{\text{elimination } (\times)}; \\ 5x + 2y &= -8 \quad \mathbf{(-4, 6)} \end{aligned}$$

$$\begin{aligned} 16. \quad 8x - 7y &= 18 \quad \mathbf{\text{elimination } (+)}; \\ 3x + 7y &= 26 \quad \mathbf{(4, 2)} \end{aligned}$$

$$\begin{aligned} 17. \quad y &= 2x \quad \mathbf{\text{substitution}}; \\ 3x + 2y &= 35 \quad \mathbf{(5, 10)} \end{aligned}$$

$$\begin{aligned} 18. \quad 3x + y &= 6 \quad \mathbf{\text{elimination } (-)}; \\ 3x + y &= 3 \quad \mathbf{\text{no solution}} \end{aligned}$$

$$\begin{aligned} 19. \quad 3x - 4y &= 17 \quad \mathbf{\text{elimination } (\times)}; \\ 4x + 5y &= 2 \quad \mathbf{(3, -2)} \end{aligned}$$

$$\begin{aligned} 20. \quad y &= 3x + 1 \quad \mathbf{\text{substitution}}; \\ 3x - y &= -1 \quad \mathbf{\text{infinitely many solutions}} \end{aligned}$$

7-3

Practice (Average)

Elimination Using Addition and Subtraction

Use elimination to solve each system of equations.

$$\begin{aligned} 1. \quad x - y &= 1 \\ x + y &= -9 \end{aligned}$$

$$(-4, -5)$$

$$\begin{aligned} 2. \quad p + q &= -2 \\ p - q &= 8 \end{aligned}$$

$$(3, -5)$$

$$\begin{aligned} 3. \quad 4x + y &= 23 \\ 3x - y &= 12 \end{aligned}$$

$$(5, 3)$$

$$\begin{aligned} 4. \quad 2x + 5y &= -3 \\ 2x + 2y &= 6 \end{aligned}$$

$$(6, -3)$$

$$\begin{aligned} 5. \quad 3x + 2y &= -1 \\ 4x + 2y &= -6 \end{aligned}$$

$$(-5, 7)$$

$$\begin{aligned} 6. \quad 5x + 3y &= 22 \\ 5x - 2y &= 2 \end{aligned}$$

$$(2, 4)$$

$$\begin{aligned} 7. \quad 5x + 2y &= 7 \\ -2x + 2y &= -14 \end{aligned}$$

$$(3, -4)$$

$$\begin{aligned} 8. \quad 3x - 9y &= -12 \\ 3x - 15y &= -6 \end{aligned}$$

$$(-7, -1)$$

$$\begin{aligned} 9. \quad -4c - 2d &= -2 \\ 2c - 2d &= -14 \end{aligned}$$

$$(-2, 5)$$

$$\begin{aligned} 10. \quad 2x - 6y &= 6 \\ 2x + 3y &= 24 \end{aligned}$$

$$(9, 2)$$

$$\begin{aligned} 11. \quad 7x + 2y &= 2 \\ 7x - 2y &= -30 \end{aligned}$$

$$(-2, 8)$$

$$\begin{aligned} 12. \quad 4.25x - 1.28y &= -9.2 \\ x + 1.28y &= 17.6 \end{aligned}$$

$$(1.6, 12.5)$$

$$\begin{aligned} 13. \quad 2x + 4y &= 10 \\ x - 4y &= -2.5 \end{aligned}$$

$$(2.5, 1.25)$$

$$\begin{aligned} 14. \quad 2.5x + y &= 10.7 \\ 2.5x + 2y &= 12.9 \end{aligned}$$

$$(3.4, 2.2)$$

$$\begin{aligned} 15. \quad 6m - 8n &= 3 \\ 2m - 8n &= -3 \end{aligned}$$

$$\left(1\frac{1}{2}, \frac{3}{4}\right)$$

$$\begin{aligned} 16. \quad 4a + b &= 2 \\ 4a + 3b &= 10 \end{aligned}$$

$$\left(-\frac{1}{2}, 4\right)$$

$$\begin{aligned} 17. \quad -\frac{1}{3}x - \frac{4}{3}y &= -2 \\ \frac{1}{3}x - \frac{2}{3}y &= 4 \end{aligned}$$

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

$$(10, -1)$$

$$\begin{aligned} 18. \quad \frac{3}{4}x - \frac{1}{2}y &= 8 \\ \frac{3}{2}x + \frac{1}{2}y &= 19 \end{aligned}$$

$$\frac{3}{2}x + \frac{1}{2}y = 19$$

$$(12, 2)$$

19. The sum of two numbers is 41 and their difference is 5. What are the numbers? **18, 23**

20. Four times one number added to another number is 36. Three times the first number minus the other number is 20. Find the numbers. **8, 4**

21. One number added to three times another number is 24. Five times the first number added to three times the other number is 36. Find the numbers. **3, 7**

22. **LANGUAGES** English is spoken as the first or primary language in 78 more countries than Farsi is spoken as the first language. Together, English and Farsi are spoken as a first language in 130 countries. In how many countries is English spoken as the first language? In how many countries is Farsi spoken as the first language?

English: 104 countries, Farsi: 26 countries

23. **DISCOUNTS** At a sale on winter clothing, Cody bought two pairs of gloves and four hats for \$43.00. Tori bought two pairs of gloves and two hats for \$30.00. What were the prices for the gloves and hats? **gloves: \$8.50, hats: \$6.50.**

7-2 Practice (Average)**Substitution**

Use substitution to solve each system of equations. If the system does *not* have exactly one solution, state whether it has *no* solution or *infinitely many* solutions.

1. $y = 6x$
 $2x + 3y = -20$ **$(-1, -6)$**

2. $x = 3y$
 $3x - 5y = 12$ **$(9, 3)$**

3. $x = 2y + 7$
 $x = y + 4$ **$(1, -3)$**

4. $y = 2x - 2$
 $y = x + 2$ **$(4, 6)$**

5. $y = 2x + 6$
 $2x - y = 2$ **no solution**

6. $3x + y = 12$
 $y = -x - 2$ **$(7, -9)$**

7. $x + 2y = 13$ **$(-3, 8)$**
 $-2x - 3y = -18$

8. $x - 2y = 3$ **infinitely many**
 $4x - 8y = 12$

9. $x - 5y = 36$ **$(-4, -8)$**
 $2x + y = -16$

10. $2x - 3y = -24$
 $x + 6y = 18$ **$(-6, 4)$**

11. $x + 14y = 84$
 $2x - 7y = -7$ **$(14, 5)$**

12. $0.3x - 0.2y = 0.5$
 $x - 2y = -5$ **$(5, 5)$**

13. $0.5x + 4y = -1$
 $x + 2.5y = 3.5$ **$(6, -1)$**

14. $3x - 2y = 11$
 $x - \frac{1}{2}y = 4$ **$(5, 2)$**

15. $\frac{1}{2}x + 2y = 12$
 $x - 2y = 6$ **$(12, 3)$**

16. $\frac{1}{3}x - y = 3$
 $2x + y = 25$
 $(12, 1)$

17. $4x - 5y = -7$
 $y = 5x$
 $(\frac{1}{3}, 1\frac{2}{3})$

18. $x - 3y = -4$
 $2x + 6y = 5$
 $(-\frac{3}{4}, 1\frac{1}{12})$

EMPLOYMENT For Exercises 19–21, use the following information.

Kenisha sells athletic shoes part-time at a department store. She can earn either \$500 per month plus a 4% commission on her total sales, or \$400 per month plus a 5% commission on total sales.

19. Write a system of equations to represent the situation.

$y = 0.04x + 500$ and $y = 0.05x + 400$

20. What is the total price of the athletic shoes Kenisha needs to sell to earn the same income from each pay scale? **\$10,000**

21. Which is the better offer? **the first offer if she expects to sell less than \$10,000 in shoes, and the second offer if she expects to sell more than \$10,000 in shoes**

MOVIE TICKETS For Exercises 22 and 23, use the following information.

Tickets to a movie cost \$7.25 for adults and \$5.50 for students. A group of friends purchased 8 tickets for \$52.75.

22. Write a system of equations to represent the situation.

$x + y = 8$ and $7.25x + 5.5y = 52.75$

23. How many adult tickets and student tickets were purchased? **5 adult and 3 student**