

## 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. $y = 6x$<br>$2x + 3y = -20$ <b><math>(-1, -6)</math></b>                | 2. $x = 3y$<br>$3x - 5y = 12$ <b><math>(9, 3)</math></b>                          | 3. $x = 2y + 7$<br>$x = y + 4$ <b><math>(1, -3)</math></b>                              |
| 4. $y = 2x - 2$<br>$y = x + 2$ <b><math>(4, 6)</math></b>                  | 5. $y = 2x + 6$<br>$2x - y = 2$ <b>no solution</b>                                | 6. $3x + y = 12$<br>$y = -x - 2$ <b><math>(7, -9)</math></b>                            |
| 7. $x + 2y = 13$ <b><math>(-3, 8)</math></b><br>$-2x - 3y = -18$           | 8. $x - 2y = 3$ <b>infinitely many</b><br>$4x - 8y = 12$                          | 9. $x - 5y = 36$ <b><math>(-4, -8)</math></b><br>$2x + y = -16$                         |
| 10. $2x - 3y = -24$<br>$x + 6y = 18$ <b><math>(-6, 4)</math></b>           | 11. $x + 14y = 84$<br>$2x - 7y = -7$ <b><math>(14, 5)</math></b>                  | 12. $0.3x - 0.2y = 0.5$<br>$x - 2y = -5$ <b><math>(5, 5)</math></b>                     |
| 13. $0.5x + 4y = -1$<br>$x + 2.5y = 3.5$ <b><math>(6, -1)</math></b>       | 14. $3x - 2y = 11$<br>$x - \frac{1}{2}y = 4$ <b><math>(5, 2)</math></b>           | 15. $\frac{1}{2}x + 2y = 12$<br>$x - 2y = 6$ <b><math>(12, 3)</math></b>                |
| 16. $\frac{1}{3}x - y = 3$<br>$2x + y = 25$<br><b><math>(12, 1)</math></b> | 17. $4x - 5y = -7$<br>$y = 5x$<br><b><math>(\frac{1}{3}, 1\frac{2}{3})</math></b> | 18. $x - 3y = -4$<br>$2x + 6y = 5$<br><b><math>(-\frac{3}{4}, 1\frac{1}{12})</math></b> |

**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**

**7-3 Practice (Average)****Elimination Using Addition and Subtraction**

Use elimination to solve each system of equations.

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

**$(-4, -5)$**

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

**$(3, -5)$**

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

**$(5, 3)$**

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

**$(6, -3)$**

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

**$(-5, 7)$**

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

**$(2, 4)$**

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

**$(3, -4)$**

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

**$(-7, -1)$**

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

**$(-2, 5)$**

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

**$(9, 2)$**

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

**$(-2, 8)$**

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

**$(1.6, 12.5)$**

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

**$(2.5, 1.25)$**

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

**$(3.4, 2.2)$**

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

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

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

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

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

**$(10, -1)$**

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

**$(12, 2)$**

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.**

## 7-4

## 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.

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

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

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

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

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

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