

## Lesson 16 Practice Problems

1. Solve each system of equations.

$$\text{a. } \begin{cases} 2x - 4y = 10 \\ x + 5y = 40 \end{cases}$$

$$\text{b. } \begin{cases} 3x - 5y = 4 \\ -2x + 6y = 18 \end{cases}$$

2. Tyler is solving this system of equations:  $\begin{cases} 4p + 2q = 62 \\ 8p - q = 59 \end{cases}$

He can think of two ways to eliminate a variable and solve the system:

- Multiply  $4p + 2q = 62$  by 2, then subtract  $8p - q = 59$  from the result.
- Multiply  $8p - q = 59$  by 2, then add the result to  $4p + 2q = 62$ .

Do both strategies work for solving the system? Explain or show your reasoning.

3. Andre and Elena are solving this system of equations:  $\begin{cases} y = 3x \\ y = 9x - 30 \end{cases}$

◦ Andre's first step is to write:  $3x = 9x - 30$

◦ Elena's first step is to create a new system:  $\begin{cases} 3y = 9x \\ y = 9x - 30 \end{cases}$

Do you agree with either first step? Explain your reasoning.

4. Select **all** systems that are equivalent to this system:  $\begin{cases} 6d + 4.5e = 16.5 \\ 5d + 0.5e = 4 \end{cases}$

A.  $\begin{cases} 6d + 4.5e = 16.5 \\ 45d + 4.5e = 4 \end{cases}$

B.  $\begin{cases} 30d + 22.5e = 82.5 \\ 5d + 0.5e = 4 \end{cases}$

C.  $\begin{cases} 30d + 22.5e = 82.5 \\ 30d + 3e = 24 \end{cases}$

D.  $\begin{cases} 6d + 4.5e = 16.5 \\ 6d + 0.6e = 4.8 \end{cases}$

E.  $\begin{cases} 12d + 9e = 33 \\ 10d + 0.5e = 8 \end{cases}$

F.  $\begin{cases} 6d + 4.5e = 16.5 \\ 11d + 5e = 20.5 \end{cases}$

5. Here is a system of equations with a solution:  $\begin{cases} p + 8q = -8 \\ \frac{1}{2}p + 5q = -5 \end{cases}$

a. Write a system of equations that is equivalent to this system. Describe what you did to the original system to get the new system.

b. Explain how you know the new system has the same solution as the original system.

6. The cost to mail a package is \$5.00. Noah has postcard stamps that are worth \$0.34 each and first-class stamps that are worth \$0.49 each.

a. Write an equation that relates the number of postcard stamps  $p$ , the number of first-class stamps  $f$ , and the cost of mailing the package.

b. Solve the equation for  $f$ .

c. Solve the equation for  $p$ .

d. If Noah puts 7 first-class stamps on the package, how many postcard stamps will he need?

(From Unit 2, Lesson 8.)

7. Here is a system of linear equations: 
$$\begin{cases} 2x + 7y = 8 \\ y + 2x = 14 \end{cases}$$

Find at least one way to solve the system by substitution and show your reasoning. How many ways can you find? (Regardless of the substitution that you do, the solution should be the same.)

(From Unit 2, Lesson 13.)

8. Here is a system of equations: 
$$\begin{cases} -7x + 3y = -65 \\ -7x + 10y = -135 \end{cases}$$

Write an equation that results from subtracting the two equations.

(From Unit 2, Lesson 14.)

9. A grocery store sells bananas for  $b$  dollars a pound and grapes for  $g$  dollars a pound. Priya buys 2.2 pounds of bananas and 3.6 pounds of grapes for \$9.35. Andre buys 1.6 pounds of bananas and 1.2 pounds of grapes for \$3.68.

This situation is represented by the system of equations: 
$$\begin{cases} 2.2b + 3.6g = 9.35 \\ 1.6b + 1.2g = 3.68 \end{cases}$$

Explain why it makes sense in this situation that the solution of this system is also a solution to  $3.8b + 4.8g = 13.03$ .

(From Unit 2, Lesson 15.)