Name: _____ Date: _____

BLM 9–8

Chapter 9 Test

Multiple Choice

For #1 to 4, select the best answer.

1. Vesna has $2.30 in dimes and quarters. She has 14 coins altogether. Let d represent the number of dimes and q represent the number of quarters. Which system of linear equations could be used to determine how many coins of each type she has?

A $d + q = 23.0$
$d + q = 14$

B $0.10d + 25q = 2.30$
$d + q = 14$

C $10d + 25q = 230$
$d + q = 14$

D $0.10d + 0.25q = 2.30$
$0.10d + 0.25q = 14$

2. Taylor and Elana were asked to solve the following system of linear equations algebraically. Their partial solutions are shown below.

$3x - y = 12$ $\quad 10x + 5y = -10$

Taylor's Solution

$10x + 5(-3x + 12) = -10$
$10x - 15x + 60 = -10$

Elana's Solution

$$\begin{array}{rl} 15x - 5y &= 60 \\ +\ 10x + 5y &= -10 \\ \hline 25x &= 50 \end{array}$$

Which of the following statements about the partial solutions is true?

A Both Taylor and Elana have a correct partial solution.

B Taylor's partial solution contains an error but Elana's does not.

C Elana's partial solution contains an error but Taylor's does not.

D Neither Taylor nor Elana has a correct partial solution.

3. A system of linear equations is given as $x + 3y = 36$ and $4x + 5y = 9$. Which of the following is a possible first step when solving algebraically?

A Rewrite the first equation as $x = 36 - 3y$.

B Rewrite the first equation as $y = \frac{1}{3}x + 12$.

C Multiply the first equation by 5 and the second equation by –1.

D Multiply the first equation by 4 and the second equation by 3.

4. Which answer is the solution to the following system of linear equations?
$2x + 2y = 1$
$3x - 2y = 24$

A $\left(23, -\frac{45}{2}\right)$ **B** $\left(-5, \frac{11}{2}\right)$

C $\left(5, -\frac{9}{5}\right)$ **D** $\left(5, -\frac{9}{2}\right)$

Numerical Response

Complete the statements in #5 to 7.

5. If the points (–5, 7) and (10, –5) both lie on the line defined by $ax + by = 15$, the value of a is ☐.

6. Jin began solving the following system of linear equations:

$-y + 2x = 10 + 2y$
$4(x + y) = 42 - y$

Jin wrote each linear equation in the form $ax + by = c$. He then needed to multiply the top equation by ☐ to eliminate the x variable by subtraction.

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7. Tickets to a local baseball game cost \$17 for adults and \$8 for youths. At one game, there were 1200 people in attendance. The total ticket sales were \$17 250. The number of youths attending the game was ☐.

Short Answer

8. State which algebraic method you would use to solve each system of linear equations. Explain each choice.

a) $9x - y = 23$
$3x - 4y = 18$

b) $7x + 5y = -15$
$3x - 9y = 10$

9. Determine the exact solution to each system of linear equations algebraically using substitution. Verify each solution by substituting into the original equations.

a) $r + 2s = 0$
$5r - 2s + 18 = 0$

b) $4x - 3y = -4$
$6x - y = 1$

10. Solve the following systems of linear equations algebraically using elimination. Verify each solution by substituting into the original equations.

a) $5x - 2y - 8 = 0$
$10x - 10y - 37 = 0$

b) $\frac{1}{2}x - \frac{2}{3}y = 6$
$\frac{1}{4}x + \frac{1}{3}y = -1$

Extended Response

11. Rebecca and Matt work at a small restaurant. As a waitress, Rebecca's daily wage is \$50 and she keeps 75% of the tips. As the cook, Matt's daily wage is \$65 and he keeps 25% of the tips.

a) Write and solve a system of linear equations to determine how much in tips must be collected for Rebecca and Matt to make the same total earnings in a day.

b) What are their total earnings in a day when their earnings are equal?

12. The percent of carbohydrates by mass in an apple is approximately 14%. The percent of carbohydrates in a pear is approximately 16%. Sonja eats 450 g of a mixture of apples and pears that contains 15.6% carbohydrates. How many grams of apple did she eat? How many grams of pear did she eat?