

LESSON **Problem Solving**
5-2 Solving Systems by Substitution

Write the correct answer.

- Maribel has \$1.25 in her pocket. The money is in quarters and dimes. There are a total of 8 coins. How many quarters and dimes does Maribel have in her pocket?

- Fabulously Fit offers memberships for \$35 per month plus a \$50 enrollment fee. The Fitness Studio offers memberships for \$40 per month plus a \$35 enrollment fee. In how many months will the fitness clubs cost the same? What will the cost be?

- Vong grilled 21 burgers at a block party. He grilled the same number of pounds of turkey burgers as hamburgers. Each turkey burger weighed $\frac{1}{4}$ pound and each hamburger weighed $\frac{1}{3}$ pound. How many of each did Vong grill?

- Kate bought 3 used CDs and 1 used DVD at the bookstore. Her friend Joel bought 2 used CDs and 2 used DVDs at the same store. If Kate spent \$20 and Joel spent \$22, determine the cost of a used CD and a used DVD.

Use the chart below to answer questions 5–8. Select the best answer. The chart compares the quotes that the Masons received from four different flooring contractors to tear out and replace a floor.

- Which expression shows the total cost if the work is done by Dad's Floors?
 A $8 + 150x$ C $150(8x)$
 B $150 + 8x$ D $158x$
- How many square feet would the Masons need to have installed to make the total cost of V.I.P. Inc. the same as the total cost of Floorshop?
 F 10 sq ft H 100 sq ft
 G 200 sq ft J 350 sq ft
- When the total costs of V.I.P. Inc. and Floorshop are the same, what is the total cost?
 A \$1125.00 C \$1950.00
 B \$1900.00 D \$3187.50

Contractor	Cost to tear out old floor	Cost of new floor per square foot
Smith & Son	\$250	\$8.00
V.I.P. Inc.	\$350	\$7.75
Dad's Floors	\$150	\$8.00
Floorshop	\$300	\$8.25

- How many square feet would the Masons need to have installed to make the total cost of Smith & Son the same as the total cost of V.I.P. Inc.?
 F 80 sq ft H 400 sq ft
 G 100 sq ft J 1000 sq ft

$q = \text{quarters}$ $q + d = 8$
 $d = \text{dimes}$ $\quad \quad -d \quad -d$
 \hline
 $q = 3$

$(q + d = 8 \text{ coins}) \cdot 25$
 $(0.25q + 0.10d = \$1.25) \cdot 1$

$.25q + .25d = 2$
 $- .25q + .10d = -1.25$

 $.15d = .75$
 $\frac{.15d}{.15} = \frac{.75}{.15}$
 $d = 5$

$$C = \text{cost}$$

$$m = \text{months}$$

$$F_{ab} \rightarrow C = 35m + 50$$

$$155 = 35(3) + 50$$

$$155 = 105 + 50$$

$$155 = 155 \checkmark$$

$$C = 40m + 35$$

$$155 = 40(3) + 35$$

$$155 = 120 + 35$$

$$155 = 155 \checkmark$$

$$F_{1+} \rightarrow C = 40m + 35$$

$$0 = -5m + 15$$

$$\begin{array}{r} -15 \\ \hline \end{array}$$

$$\frac{-15}{-5} = \frac{-5m}{-5}$$

$$3 = m$$

$$C = 35(3) + 50$$

$$C = 105 + 50$$

$$C = 155$$

$$Dvd = D$$

$$CD = C$$

$$\text{Kate} \rightarrow 3c + 1d = 20$$

$$\text{Joel} \rightarrow 2c + 2d = 22$$

$$(3c + 1d = 20) \cdot 2 \rightarrow 6c + 2d = 40$$

$$(2c + 2d = 22) \cdot 1 \rightarrow 2c + 2d = 22$$

$$\begin{array}{r} 4c = 18 \\ \hline \end{array}$$

$$3(4.50) + 1d = 20$$

$$13.50 + d = 20$$

$$\begin{array}{r} -13.50 \\ \hline \end{array}$$

$$C = 4.50$$

$$D = 6.50$$