

1-2

Solving Linear Equations

MODEL & DISCUSS

Joshua is going kayaking with a group during one of his vacation days. In his vacation planning, he budgeted \$50 for a kayak rental.

KAYAK RENTALS



Rental Rates	
	Per hour
single kayak	\$15
single sea kayak	\$18
double kayak	\$25

- A. How can Joshua determine the number of hours he can rent a kayak for himself? Describe two different options.
- B. Joshua found out that there is a \$25 nonrefundable equipment fee in addition to the hourly rates. How does this requirement change the mathematics of the situation?
- C. **Look for Relationships** How do the processes you used for parts A and B differ? How are they the same? © MP.7

HABITS OF MIND

Make Sense and Persevere How did you determine which operations are needed to solve the problem? © MP.1

**EXAMPLE 1** **Try It! Solve Linear Equations**

1. Solve the equation $4 + \frac{3x-1}{2} = 9$. Explain the reasons why you chose your solution method.

HABITS OF MIND

Communicate Precisely How can you check that the value of the variable makes the equation true? **MP.6**

EXAMPLE 2 **Try It! Solve Consecutive Integer Problems**

2. The sum of three consecutive odd integers is 57. What are the three integers?

EXAMPLE 3 **Try It! Use Linear Equations to Solve Mixture Problems**

3. If the lab technician needs 30 liters of a 25% acid solution, how many liters of the 10% and the 30% acid solutions should she mix to get what she needs?

EXAMPLE 4  **Try It! Use Linear Equations to Solve Problems**

4. The same four friends buy tickets for two shows on consecutive nights. They use a coupon for \$5 off each ticket. They pay a total of \$416 for 8 tickets. Write and solve an equation to find the original price of the tickets.

EXAMPLE 5  **Try It! Solve Work and Time Problems**

5. LaTanya leaves her house at 12:30 P.M. and bikes at 12 mi/h to Marta's house. She stays at Marta's house for 90 min. Both girls walk back to LaTanya's house at 2.5 mi/h. They arrive at LaTanya's house at 3:30 P.M. How far is Marta's house from LaTanya's house?

HABITS OF MIND

Look for Relationships What patterns can you identify in the solutions for Examples 3, 4, and 5? © MP.7



Do You UNDERSTAND?

- 1. ? ESSENTIAL QUESTION** How do you create equations and use them to solve problems?
- 2. Reason** What is a first step to solving for x in the equation $9x - 7 = 10$? How would you check your solution? © MP.2
- 3. Use Structure** For an equation with fractions, why is it helpful to multiply both sides of the equation by the LCD? © MP.7
- 4. Error Analysis** Venetta knows that $1 \text{ mi} \approx 1.6 \text{ km}$. To convert 5 mi/h to km/h , she multiplies 5 mi/h by $\frac{1 \text{ mi}}{1.6 \text{ km}}$. What error does Venetta make? © MP.3

Do You KNOW HOW?

Solve each equation.

5. $4b + 14 = 22$

6. $-6k - 3 = 39$

7. $15 - 2(3 - 2x) = 46$

8. $\frac{2}{3}y - \frac{2}{5} = 5$

- 9. Mathematical Modeling** Terrence walks at a pace of 2 mi/h to the theater and watches a movie for 2 h and 15 min . He rides back home, taking the same route, on the bus that travels at a rate of 40 mi/h . The entire trip takes 3.5 h . How far along this route is Terrence's house from the theater? Explain.

