

EXPLORE & REASON

Some friends want to see a movie that is showing at two different theaters in town. They plan to share 3 tubs of popcorn during the movie.



	Theater A	Theater B
Ticket Price	\$14.50	\$13.00
Popcorn	\$5.75	\$6.75

- A. **Construct Arguments** Which movie theater should the friends choose? Explain. © MP.3
- B. For what situation would the total cost at each theater be exactly the same? Explain.
- C. There are different methods to solving this problem. Which do you think is the best? Why?

HABITS OF MIND

Make Sense and Persevere What assumptions did you make that helped you work through the Explore & Reason? © MP.1



EXAMPLE 1

**Try It! Solve Equations With a Variable on Both Sides**

1. Solve each equation.

a. $100(z - 0.2) = -10(5z + 0.8)$

b. $\frac{5}{8}(16d + 24) = 6(d - 1) + 1$

EXAMPLE 2

**Try It! Understand Equations with Infinitely Many or No Solutions**

2. Solve each equation. Is the equation an identity? Explain.

a. $t - 27 = -(27 - t)$

b. $16(4 - 3m) = 96\left(-\frac{m}{2} + 1\right)$

HABITS OF MIND

Construct Arguments One student maintains that the order in which terms are collected on each side of an equation does not matter. Construct an argument to support or refute the student's position. © MP.3



EXAMPLE 3  **Try It! Solve Mixture Problems**

- How many pounds of Arabica coffee should you mix with 5 pounds of Robusta coffee to make a coffee blend that costs \$12.00 per pound?

HABITS OF MIND

Generalize How can you determine whether an equation has infinitely many or no solutions? © MP.8

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

- Cameron's friend tells him of another service that has a \$15 joining fee but charges \$0.80 per song. At what number of songs does this new service become a less expensive option to Cameron's current service?

Do You UNDERSTAND?

1. **ESSENTIAL QUESTION** How do you create equations with a variable on both sides and use them to solve problems?

2. **Vocabulary** Why does it make sense to describe an equation that has infinitely many solutions as an *identity*?

3. **Error Analysis** Isabel says that the equation $x - 2 = -(x - 2)$ has no solution because a number can never be equal to its opposite. Explain the error Isabel made. © MP.3

4. **Look for Relationships** You are solving an equation with a variable on each side. Does the side on which you choose to isolate the variable affect the solution? Why might you choose one side over the other? © MP.7

Do You KNOW HOW?

Solve each equation.

5. $5(2x + 6) = 8x + 48$

6. $-3(8 + 3h) = 5h + 4$

7. $2(y - 6) = 3(y - 4) - y$

8. $8x - 4 = 2(4x - 4)$

9. For how many games is the total cost of bowling equal for the two bowling establishments?

Family Bowling		
Cost (dollars)	Game	4.00
	Shoes	1.00
Knight Owl Bowling		
Cost (dollars)	Game	3.75
	Shoes	2.00