

# Unit 6 Lesson 14: Finding Solutions to Inequalities in Context

## 1 Solutions to Equations and Solutions to Inequalities (Warm up)

### Student Task Statement

1. Solve  $-x = 10$
2. Find 2 solutions to  $-x > 10$
3. Solve  $2x = -20$
4. Find 2 solutions to  $2x > -20$

## 2 Earning Money for Soccer Stuff

### Student Task Statement

1. Andre has a summer job selling magazine subscriptions. He earns \$25 per week plus \$3 for every subscription he sells. Andre hopes to make at least enough money this week to buy a new pair of soccer cleats.
  - a. Let  $n$  represent the number of magazine subscriptions Andre sells this week. Write an expression for the amount of money he makes this week.
  - b. The least expensive pair of cleats Andre wants costs \$68. Write and solve an equation to find out how many magazine subscriptions Andre needs to sell to buy the cleats.
  - c. If Andre sold 16 magazine subscriptions this week, would he reach his goal? Explain your reasoning.
  - d. What are some other numbers of magazine subscriptions Andre could have sold and still reached his goal?
  - e. Write an *inequality* expressing that Andre wants to make at least \$68.
  - f. Write an inequality to describe the number of subscriptions Andre must sell to reach his goal.
  
2. Diego has budgeted \$35 from his summer job earnings to buy shorts and socks for soccer. He needs 5 pairs of socks and a pair of shorts. The socks cost different amounts in different stores. The shorts he wants cost \$19.95.
  - a. Let  $x$  represent the price of one pair of socks. Write an expression for the total cost of the socks and shorts.
  - b. Write and solve an equation that says that Diego spent exactly \$35 on the socks and shorts.
  - c. List some other possible prices for the socks that would still allow Diego to stay within his budget.
  - d. Write an inequality to represent the amount Diego can spend on a single pair of socks.

### 3 Granola Bars and Savings

#### Student Task Statement

1. Kiran has \$100 saved in a bank account. (The account doesn't earn interest.) He asked Clare to help him figure out how much he could take out each month if he needs to have at least \$25 in the account a year from now.
  - a. Clare wrote the inequality  $-12x + 100 \geq 25$ , where  $x$  represents the amount Kiran takes out each month. What does  $-12x$  represent?
  - b. Find some values of  $x$  that would work for Kiran.
  - c. We could express *all* the values that would work using either  $x \leq \underline{\quad}$  or  $x \geq \underline{\quad}$ . Which one should we use?
  - d. Write the answer to Kiran's question using mathematical notation.
2. A teacher wants to buy 9 boxes of granola bars for a school trip. Each box usually costs \$7, but many grocery stores are having a sale on granola bars this week. Different stores are selling boxes of granola bars at different discounts.
  - a. If  $x$  represents the dollar amount of the discount, then the amount the teacher will pay can be expressed as  $9(7 - x)$ . In this expression, what does the quantity  $7 - x$  represent?
  - b. The teacher has \$36 to spend on the granola bars. The equation  $9(7 - x) = 36$  represents a situation where she spends all \$36. Solve this equation.
  - c. What does the solution mean in this situation?
  - d. The teacher does not have to spend all \$36. Write an inequality relating 36 and  $9(7 - x)$  representing this situation.
  - e. The solution to this inequality must either look like  $x \geq 3$  or  $x \leq 3$ . Which do you think it is? Explain your reasoning.