# Unit 4 Lesson 4: 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 $x \leq$ __ or $x \geq$ __. 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.