4.5 May I Have More, Please?

A Solidify Understanding Task

Elvira, the cafeteria manager, has to be careful with her spending and manages the cafeteria so that they can serve the best food at the lowest cost. To do this, Elvira keeps good records and analyzes all of her budgets.

1. Elvira's cafeteria has those cute little cartons of milk that are typical of school lunch. The milk supplier charges $0.35 per carton of milk, in addition to a delivery charge of $75. What is the maximum number of milk cartons that Elvira can buy if she has budgeted $500 for milk?

    a. Write and solve an inequality that models this situation.

    b. Describe in words the quantities that would work in this situation.

    c. Write your answer in both interval and set notation.

2. Students love to put ranch dressing on everything, so Elvira needs to keep plenty in stock. The students eat about 2.25 gallons of ranch each day! Elvira started the school year with 130 gallon of ranch dressing. She needs to have at least 20 gallons left when she reorders to have enough in stock until the new order comes. For how many days will her ranch dressing supply last before she needs to reorder?

    a. Write and solve an inequality that models this situation.

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    b. Describe in words the quantities that would work in this situation.

    c. Write your answer in both interval and set notation.

3. The prices on many of the cafeteria foods change during the year. Elvira finds that she has ordered veggie burgers four times and paid $78, $72, $87, and $90 on the orders. To stay within her budget, Elvira needs to be sure that the average order of veggie burgers is not more than $82. How much can she spend on the fifth order to keep the average order within her budget?

    a. Write and solve an inequality that models this situation.

    b. Describe in words the quantities that would work in this situation.

    c. Write your answer in both interval and set notation.

4. Elvira can purchase ready-made pizzas for $14.50 each. If she makes them in the cafeteria, she can spend $44.20 on ingredients and $6.25 per pizza on labor. For how many pizzas is it cheaper for the cafeteria to make the pizzas themselves rather than buy them ready-made?

    a. Write and solve an inequality that models this situation.

    b. Describe in words the quantities that would work in this situation.

    c. Write your answer in both interval and set notation.

5. Elvira is comparing prices between two different suppliers of fresh lettuce. Val's Veggies charges $250 for delivery plus $1.50 per bag of lettuce. Sally's Salads charges $100 for delivery plus $4.00 per bag of lettuce. How many bags of lettuce must be purchased for Val's Veggies to be the cheaper option?

    a. Write and solve an inequality that models this situation.

    b. Describe in words the quantities that would work in this situation.

    c. Write your answer in both interval and set notation.

6. Each student that buys school lunch pays $2.75. The cafeteria typically brings in between $1168.75 and $1438.25. How many students does the cafeteria usually serve?

    a. Model this situation using an inequality.

    b. Describe in words the quantities that would work in this situation.

    c. Write your answer in both interval and set notation.

4.5

READY, SET, GO!	Name	Period	Date

READY

Topic: Interpret phrases that imply an inequality.

Rewrite the given "word sentence" as a "math sentence." Each math sentence will use one of the following symbols: $>$, $<$, $\leq$, $\geq$. Use "x" in place of the number.

	Word Sentence	Math Sentence
Example:	I am thinking of a number that is greater than 13.	$x > 13$
1.	I am thinking of a number that is at least 13.	
2.	I am thinking of a number that is no fewer than 13.	
3.	I am thinking of a number that does not exceed 13.	
4.	I am thinking of a number that is at most 13.	
5.	I am thinking of a number that is no more than 13.	
6.	I am thinking of a number that is fewer than 13.	
7.	I am thinking of a number that is not above 13.	
8.	I am thinking of a number that is less than 13.	
9.	I am thinking of a number that is not under 13.	
10.	I am thinking of a number that is not greater than 13.	

SET

Topic: Write and solve inequalities from a context.

11. To take sweepstakes for the largest pumpkin crop at the Riverside County Fair, the average weight of Ethan's two pumpkins must be greater than 875 lbs. One of his pumpkins weighs 903 lbs. What is the least amount of pounds the second pumpkin could weigh in order for Ethan to win the prize?

    a) Write an inequality that models this situation. Be sure to define your variables.

    b) Describe in words the quantities that would work in this situation.

    c) Write your answer in both interval and set notation.

12. The average of Aaron's three test scores must be at least 93 to earn an A in the class. Aaron scored 89 on the first test and 94 on the second test. What scores can Aaron get on his third test to guarantee an A in the class? (The highest possible score is 100.)

    a) Write and solve an inequality that models this situation. Be sure to define your variables.

    b) Describe in words the quantities that would work in this situation.

    c) Write your answer in both interval and set notation.

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13. A cell phone company offers a plan that costs $35.99 and includes unlimited texting. Another company offers a plan that costs $19.99 and charges $0.25 per text. For what number of texts does the second company's plan cost more than the first company's plan?

    a) Write and solve an inequality that models this situation. Be sure to define your variables.

    b) Describe in words the quantities that would work in this situation.

    c) Write your answer in both interval and set notation.

GO

Topic: Use substitution to solve linear systems

Solve each system of equations by using substitution.

Example: $\begin{cases} y = x + 3 \\ 2x - y = 14 \end{cases}$

The first equation states that $y = x + 3$. That information can be used in the second equation to find the value of x by replacing y with $x + 3$. The second equation now says $2x - (x + 3) = 14$. Solve this new equation by first distributing the negative over $(x + 3)$. The new equation will be $2x - x - 3 = 14$. Combine like terms. You will get the equivalent equation $x - 3 = 14$. Add 3 to both sides. You should get $x = 17$. But you still don't know the value of y. Now that you know the value of x, you can use either equation to figure out the value of y. Since the first equation is simpler, you may want to substitute the known value of x (recall that $x = 17$) into it. It should be easy to see what y equals. $y = (17) + 3 = 20$.

21. $\begin{cases} y = x + 5 \\ 2x + y = -1 \end{cases}$
        22. $\begin{cases} x = y - 1 \\ 5x + 2y = 9 \end{cases}$

23. $\begin{cases} y = 10 - x \\ 4x - 2y = 40 \end{cases}$
        24. $\begin{cases} x = 1 + y \\ 4x - y = 7 \end{cases}$

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