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?

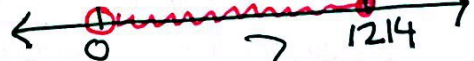
   a. Write and solve an inequality that models this situation. m - # of milk cartons

   $.35m + 75 \leq 500$
   $-75 \quad -75$
   $\frac{.35m}{.35} \leq \frac{425}{.35}$
   $m \leq 1,214.29$

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

   The number of milk cartons that Elvira can buy is less than or equal to 1,214 and more than 0. (Assuming she buys milk)

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

   $(0, 1214]$ $\quad \{m \mid 0 < m \leq 1214\}$

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. d - # of days the ranch supply will last.

   $130 - 2.25d \geq 20$
   $-130 \quad -130$
   $\frac{-2.25d}{-2.25} \geq \frac{-110}{-2.25}$
   $d \leq 48.89$

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

The number of days the ranch supply will last is less than or equal to 48.

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

$[0, 48]$ $\{d \mid 0 \leq d \leq 48\}$

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. X - the amount spent on the fifth order.

$\frac{78+72+87+90+X}{5} \leq 82$

$(5)\ \frac{327+X}{5} \leq 82(5)$

$327 + X \leq 410$

$-327 \quad -327$

$X \leq 83$

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

The amount spent on the fifth order has to be less than or equal to \$83

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

$[0, 83]$ $\{x \mid 0 \leq x \leq 83\}$

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. p - the # of pizzas

Ready-made > Cafeteria-made

$14.5p > 44.2 + 6.25p$

$-6.25p \quad -6.25p$

$8.25p > 44.2$

$p > 5.36$

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

The number of pizzas is ~~greater than~~ 6 or more.

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

$[6, +\infty)$