

$$\begin{array}{r} 27 \ 36 \\ 29 \ 324 \\ \hline \end{array}$$

$$f(x) = 4 \cdot 9^{x-25}$$

$$\begin{array}{r} 2 \ 16 \\ 3 \ 8 \\ 4 \ 4 \end{array}$$

$$f(x) = 32 \cdot \frac{1}{2}^{x-1}$$

$$\begin{array}{r} x \ y \\ 2 \ 9 \\ 3 \ 18 \\ 4 \ 36 \end{array}$$

$$f(x) = 9 \cdot 2^{x-2}$$

4.1 11/13/15

$12 \times 3 + 24 = 60$  TRAYS  $\div 4 = 15$  in each carton

$$T = 12$$

$$3T = 12(3) \text{ mult. property of equality}$$

$$-24 \quad +24 \text{ addition property of equality}$$

$$\frac{3T + 24 = 60}{4} \text{ division property of equality}$$

$$\frac{3T + 24}{4} = 15$$

$$C = 15$$

$$4(C) = 4(15) \text{ mult. property of equality}$$

$$4C = 60$$

$$-24 \quad -24 \text{ subtr. property of equality}$$

$$\frac{4C - 24 = 36}{3}$$

Multi-Step Equations

$$\frac{3}{1} \cdot \frac{4C - 24}{3} = 12 \cdot 3 \text{ mult. prop. of equality}$$

$$4C - 24 = 36 \text{ add. prop. of equality}$$

$$+24 \quad +24$$

$$\frac{4C = 60}{4} \text{ div. prop. of equality}$$

$$C = 15$$

Equivalent Equations: Equations that have the same solution for x.

$$\boxed{2c + 4 = 36}$$

$$\cdot 3 \quad \cdot 3$$

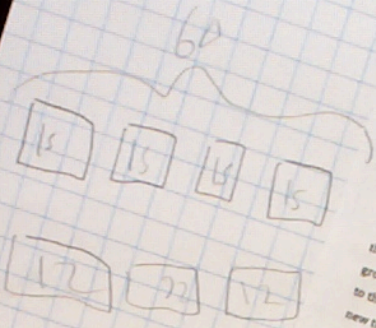
$$2c + 4 = 36$$

$$\cdot 4 \quad \cdot 4$$

$$2c = 32$$

$$\frac{2c}{2} = \frac{32}{2}$$

$$\boxed{c = 16}$$



$$T = 12$$

$$3T = 12(3) \text{ mult. property}$$

$$+24 \quad +24 \text{ addition property}$$

$$3T + 24 = 2(3) + 24$$

$$\frac{3T + 24}{4} \text{ division property}$$

$$4$$

$$15 \text{ subtraction property}$$

### 4.1 Cafeteria Actions and Reactions

#### A Develop Understanding Task



Elvira, the cafeteria manager, has just received a shipment of new trays with the school logo prominently displayed in the middle of the tray. After unloading 4 cartons of trays in the pizza line, she realizes that students are arriving for lunch and she will have to wait until lunch is over before unloading the remaining cartons. The new trays are very popular and in just a couple of minutes 24 students have passed through the pizza line and are showing off the school logo on the trays. At this time, Elvira decides to divide the remaining trays in the pizza line into 3 equal groups so she can also place some in the salad line and the sandwich line, hoping to attract students to the other lines. After doing so, she realizes that each of the three serving lines has only 12 of the new trays.

"That's not many trays for each line. I wonder how many trays there were in each of the cartons I unloaded?"

1. Help the cafeteria manager answer her question using the data in the story about each of the actions she took. Explain how you arrive at your solution.

$$12 \times 3 + 24 \div 4$$

- Elvira is interested in collecting data about how many students use each of the tables during each lunch period. She has recorded some data on Post-it Notes to analyze later. Here are the notes she has recorded:
- Some students are sitting at the front table. (I got distracted by an incident in the back of the lunchroom, and forgot to record how many students.)
  - Each of the students at the front table has been joined by a friend, doubling the number of students at the table.
  - Four more students have just taken seats with the students at the front table.
  - The students at the front table separated into three equal groups.
  - As the lunch period ends, the

4

15

subtraction property

Equivalent equations:

$$\frac{2c + 4}{3} = 12$$

equations the same they have solution of x

$$2c + 4 = 36$$

$$- 4$$

$$c = 16$$

- Four more students have just taken seats with the students at the front table.
- The students at the front table separated into three equal-sized groups and then two groups left, leaving only one-third of the students at the table.
- As the lunch period ends, there are still 12 students seated at the front table.