

3-8 Applying Equations and Inequalities

(Pages 156–159)

You can solve many real-life problems by translating them into equations or inequalities.

EXAMPLE

The CPU on Suzette's computer has quit working. She wants to replace it with a faster CPU. However, she only has \$300 to spend on the replacement. If the computer repair shop charges \$79 in labor to replace a CPU, what is the most Suzette can spend on a new CPU?

Let c = the price of the CPU.

$$c + 79 \leq 300. \quad \text{The labor charge is \$79, and Suzette cannot spend more than \$300.}$$

So, the cost of the CPU plus the labor charge must be less than or

$$c + 79 - 79 \leq 300 - 79 \quad \text{equal to \$300.}$$

$$c \leq \$221 \quad \text{Suzette can spend up to \$221 on a new CPU and stay within her \$300 budget.}$$

PRACTICE

Define a variable and translate each sentence into an equation or inequality. Then solve.

- What is the least number you can multiply by 8 to get a product that is 160 or greater?
- Harry bought a car for \$6000. That is at least $\frac{1}{2}$ of the original cost of the car. What was the original cost of the car?
- The bill for labor at \$17 per hour was at least \$68. How many hours of labor were there?
- Stacey waits tables at Dave's Diner. Her average tip total per hour is \$16. How many hours does she need to work to earn at least \$80 in tips?
- Write a realistic problem that could be solved using the equation $15c = 285$.
- Aviation** The first rocket traveled at a speed of 45 miles per hour. To go into orbit, a rocket must achieve an escape velocity of 20,000 miles per hour. How many times the speed of the first rocket is escape velocity? Round your answer to the nearest whole number.



- Standardized Test Practice** The volume of a rectangular box is found by multiplying its length, width, and height. If the volume of a box with width 6 centimeters and height 8 centimeters is 216 cubic centimeters, what is the length of the box?

A 168 cm

B 5 cm

C 4.5 cm

D 3.5 cm

Answers: 1. 20 2. \$12,000 or less 3. 4 hours or more 4. 5 hours or more 5. Sample answer: If you can buy 15 items for \$285, what is the cost per item? 6. 444 7. C