Worksheet 4-15: Applications of Linear Equations

1. A phone company charges \$20 per month, plus \$0.10 per minute for long distance calling. Total monthly phone charges can be represented by the equation $C = 20 + 0.1m$ where C is total monthly phone charges in dollars, and m is the number of minutes of long distance calling.

(a) Determine the total cost for 180 min of long distance calls one month.

(b) How many minutes of long distance calling were made in one month for a total cost of \$29?

2. In Canada, temperature is measured in degrees Celsius, C. In the United States, temperature is measured in degrees Fahrenheit, F. The equation $9C = 5F - 160$ is used to convert between the two temperature scales.

(a) What is 14°F in degrees Celsius?

(b) What is 30°C in degrees Fahrenheit?

3. An empty tanker truck has a mass of 14 000 kg. One barrel of oil has a mass of 180 kg. The equation $M = 14000 + 180b$ represents the total mass of the truck, M kilograms, when it contains b barrels of oil. The truck enters a weigh station that shows its total mass is 51 080 kg. How many barrels of oil are on the truck?

4. The cost to rent a hall for the prom is $400 for the hall and $30 per person for the meal. This can be modelled by the equation $C = 400 + 30x$, where x is the number of students attending.

(a) Suppose 150 students attend. What will be the cost of the prom?

(b) The prom committee has a budget of $10 000. What is the greatest number of students that can attend with this budget?

Answers: 1. (a) $38, **(b)** 90 min; **2. (a)** −10°C, **(b)** 86°F; **3.** 180; **4.** $4900, **(b)** 320