37. **a.** 22 cm; 38 cm^2
b. 29.2 cm; 67.9 cm^2

38. Take the $5000 because it would take you 272 years to count out the $5 billion in single dollar bills.

39. 9.818×10^{-2} m

40. 1.79×10^{-9} m

extension

Graphing Calculator Practice

Visit go.hrw.com for answers to this Graphing Calculator activity.

Keyword HF6SOPXT

MIXED REVIEW

37. Calculate the circumference and area for the following circles. (Use the following formulas: circumference = $2\pi r$ and area = πr^2.)

a. a circle of radius 3.5 cm

b. a circle of radius 4.65 cm

38. A billionaire offers to give you (1) $5 billion if you will count out the amount in $1 bills or (2) a lump sum of $5000. Which offer should you accept? Explain your answer. (Assume that you can count at an average rate of one bill per second, and be sure to allow for the fact that you need about 10 hours a day for sleeping and eating. Your answer does not need to be limited to one significant figure.)

39. Exactly 1 quart of ice cream is to be made in the form of a cube. What should be the length of one side in meters for the container to have the appropriate volume? (Use the following conversion: 4 qt = 3.786×10^{-3} m^3.)

40. You can obtain a rough estimate of the size of a molecule with the following simple experiment: Let a droplet of oil spread out on a fairly large but smooth water surface. The resulting "oil slick" that forms on the surface of the water will be approximately one molecule thick. Given an oil droplet with a mass of 9.00×10^{-7} kg and a density of 918 kg/m^3 that spreads out to form a circle with a radius of 41.8 cm on the water surface, what is the approximate diameter of an oil molecule?

Graphing Calculator Practice

Mass Versus Length

What is the relationship between the mass and length of three wires, each of which is made of a different substance? All three wires have the same diameter. Because the wires have the same diameter, their cross-sectional areas are the same. The cross-sectional area of any circle is equal to πr^2. Consider a wire with a diameter of 0.50 cm and a density of 8.96 g/cm^3. The following equation describes the mass of the wire as a function of the length:

$$Y_1 = 8.96X^*\pi(0.25)^2$$

In this equation, Y_1 represents the mass of the wire in grams, and X represents the length of the wire in centimeters. Each of the three wires is made of a different substance, so each wire has a different density and a different relationship between its mass and length.

In this graphing calculator activity, you will

- use dimensional analysis
- observe the relationship between a mathematical function and a graph
- determine values from a graph
- gain a better conceptual understanding of density

Visit go.hrw.com and type in the keyword **HF6SOPX** to find this graphing calculator activity. Refer to **Appendix B** for instructions on downloading the program for this activity.