Lesson 8 Practice Problems

1. A baker makes muffins that serve 1 person each. For a party, the baker is asked to make a large muffin in the same shape as the individual muffins that will serve 100 people.

   a. By what scale factor will the muffin need to be dilated?

   b. The muffins are contained in decorative paper liners. How many times more paper will be required for the dilated muffin as for the original?

2. A board game manufacturer wraps its game boxes in plastic. Its most popular game comes in a box that's 8 cm tall and uses 1408 square centimeters of plastic wrap. The company sells a travel version of the game in a box that's a dilation of the original box. The travel version uses 198 square centimeters of plastic wrap. How tall is the travel version's box?

3. A cone has surface area 360π in^2 and volume 800π in^3. The cone is dilated, and the surface area of the dilated cone is $2{,}250\pi$ in^2. What is the dilated cone's volume?

4. A scale model of an oil tanker truck can hold 1 gallon of oil. If a trucking company wants the full-size truck to hold 8,000 gallons of oil, what scale factor must they apply to the model?

(From Unit 5, Lesson 7.)

5. A solid has volume 4 cubic units. The equation $k = \sqrt[3]{\frac{V}{4}}$ represents the scale factor of k by which the solid must be dilated to obtain an image with volume V cubic units. List 2 points which are on the graph representing this equation.

(From Unit 5, Lesson 7.)

6. A cube has edge length 3 inches.

   a. Find the surface area and volume of the cube.

   b. The cube is dilated by a scale factor of 0.5. Find the surface area and volume of the image.

(From Unit 5, Lesson 6.)

7. A circle with an area of 100π square centimeters is dilated so that its image has an area of 25π square centimeters. What is the scale factor of the dilation?

   A. 4

   B. 2

   C. $\frac{1}{2}$

   D. $\frac{1}{4}$

(From Unit 5, Lesson 5.)