

## Volume Applications

**Answer the following questions. Draw pictures to help your calculations.**

- 1) Find the volume of a cylinder with a diameter of 12 cm and a height of 9 cm.

If the cylinder was reduced by a half (all dimensions were cut in half), what would the volume become?

Can you find the volume without plugging the new dimensions into the volume formula?

- 2) A company introduced a new box that was twice the height of the original box. What is the volume of the new box if the original box was 12 inches high, 7 inches wide, and 7 inches long?

- 3) Juan had a rectangular garden in his backyard that was 10 feet long and 6 feet wide. His father told him that he could double the width in order to plant more vegetables.

What is the perimeter of his new garden?

What is the area of his new garden?

4) A company had a box that was 4m long, 3m wide, and 2m high. They created a new box that was double the length and width, but the height remained the same. What is the volume of the new box? How much larger is the new box than the original box?

5) You have two circles with circumference of  $\pi$  and  $4\pi$ .

What is the ratio of the areas of the circles?

What is the ratio of the diameters?

What is the ratio of the radii?

6) Jesse used 1-foot square tiles to cover the floor of his 6-foot-by-6-foot bathroom and wants to use the same tiles in the kitchen. The floor of his kitchen is double the length and double the width of the bathroom floor. How many times the number of floor tiles used to cover the bathroom floor should it take to cover the kitchen floor?

7) Wilma made a decorative piece shaped like a square pyramid with a base length of 3 inches and a height of the pyramid of 8 inches. She wants to double the volume of the piece. What dimension(s) would she have to change in order to double the volume?

8) Daniel is designing and building a small storage shed. He wants the dimensions of the shed to be one half the dimensions of a shed that has a length 10 ft, a width of 10 ft, and a height of 8 ft. What will be the fraction of the volume of the original shed?

9) The Gordons decided to enlarge their circular fishpond. The original pond had a diameter of 7 feet. The enlarged pond has a radius of 14 feet. How many times the area of the original pond is the area of the enlarged pond?

10) The cover of a calendar is printed on a sheet of paper that measures 60 cm by 30 cm. The diagonal of this sheet of paper is 67.1 cm. If a smaller version of this calendar is printed on a sheet of paper with  $\frac{1}{4}$  the area, by what factor would the length of the diagonal decrease?

- A)  $\frac{1}{2}$       B) 2      C)  $\frac{1}{4}$       D)  $\frac{1}{3}$

11) A store that specializes in realistic miniature furniture wants to model a circular end table. The company wants to reduce the diameter of the tabletop by a factor of  $\frac{1}{2}$ . How is the area of the table top affected?

- A) It is reduced by a scale factor of  $\frac{1}{2}$       B) It is enlarged by a scale factor of 4  
C) It is enlarged by a scale factor of 2      D) It is reduced by a scale factor of  $\frac{1}{4}$