

Area and Volume Problems

1. Each sheet in a roll of toilet paper measure 4.8 inches by 2.2 inches. There are 1000 sheets in the roll. The radius of the entire roll of toilet paper is 3 inches. The radius of the hollow cylinder in the middle is 0.8 inches. What is the volume of the toilet paper (not including the hollow cylinder in the middle)? What is the thickness of each sheet of paper?

2. The base of a rectangular prism is a 3-foot square. The height is 12 feet. What is the volume of the prism?

3. I would like to redecorate my bedroom. First I want to put in wall-to-wall carpeting and paint the walls a new color. My bedroom is rectangular, 10 feet long and 12 feet wide. The distance from the floor to the ceiling is 8 feet.
 - a. How many square feet of carpeting do I need to cover my bedroom floor?
 - b. One bucket of paint covers 8 square feet of wall space. How many buckets of paint do I need to paint all four walls of my bedroom?

4. Each base path in the infield of a major league baseball field is 90 feet long.
 - a. What is the perimeter of the infield base paths?
 - b. What is the area of the infield?
 - c. If you drew a straight line from second base to home plate to create two right triangles, what would the distance from second base to home plate be?
 - d. What is the area of one of the triangles you made in part c above?

5. Mark's parents buy him an inflatable pool for the backyard. The pool is in the shape of a circle that is 18' across. Mark sets up the pool and is ready to fill it. If Mark wants the water in the pool to be 3' deep, how much water will it take to fill the pool to Mark's specifications? (Hint: 1 gallon = 0.134 ft³)

6. I have a rectangular yard that is 18 feet long and 8 feet wide. My friend has a square yard that has the same area as my rectangular yard. How long is each side of my friend's square yard?
7. A new turf field is going to be installed at Gillette Stadium, but the dimensions of the field are unknown. If the field is a rectangle with a perimeter of 340 yards with two sides equal to 50 yards, what is the area of the field?
8. Hardwood flooring is sold in boxes that each covers 22.5 square feet. Each box costs \$70.95. A room with measurements of 20' x 24' needs flooring, but it has a stairway hole that measures 4' x 12' that does not need to be floored.
- What area (in square feet.) needs to be covered in flooring? Show work.
 - How many boxes of flooring are needed to cover the floor?
 - What is the total cost of the flooring?
9. A mason needs to build a rectangular brick patio that measures 12 feet by 18 feet around a circular fountain that is 8 feet in diameter. If each brick measures 4 inches by 8 inches, how many bricks will he need to complete the job?
10. Simone bought a new fish tank that is a rectangular prism with dimensions of: length = $37\frac{3}{4}$ inches, width = $11\frac{1}{2}$ inches and height = $17\frac{1}{8}$ inches.
- What is the volume of the fish tank?
 - One gallon of water takes up about 231 cubic inches of space. About how many gallons of water will this tank hold?
 - What will be the depth of the water if there are 10 gallons of water in the tank?
11. The Mars Cereal Company has two different cereal boxes for Mars Cereal. The large box is 8 inches wide, 11 inches high, and 3 inches deep. The small box is 6 inches wide, 10 inches high, and 2.5 inches deep.
- How much more cardboard is needed to make the large box than the small box?
 - How much more cereal does the large box hold than the small box?