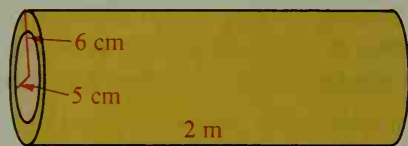
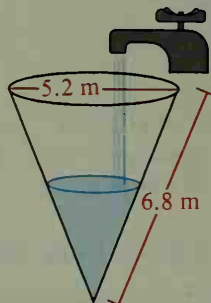


22. A pipe is 2 m long and has inside radius 5 cm and outside radius 6 cm. Find the volume of metal contained in the pipe to the nearest cubic centimeter. Use  $\pi \approx 3.14$ .

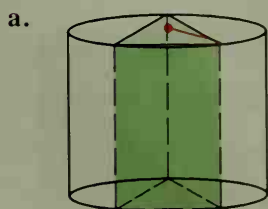
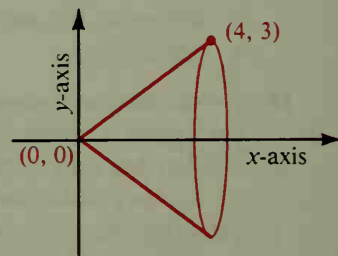


Ex. 22

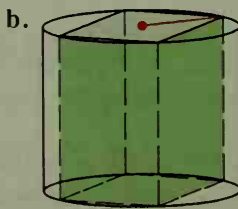


Ex. 23

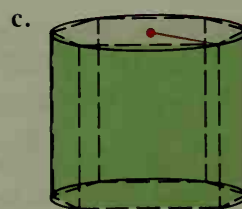
23. Water is pouring into a conical (cone-shaped) reservoir at the rate of  $1.8 \text{ m}^3$  per minute. Find, to the nearest minute, the number of minutes it will take to fill the reservoir. Use  $\pi \approx 3.14$ .
24. Two water pipes of the same length have inside diameters of 6 cm and 8 cm. These two pipes are replaced by a single pipe of the same length, which has the same capacity as the smaller pipes combined. What is the inside diameter of the new pipe?
25. The total area of a cylinder is  $40\pi$ . If  $h = 8$ , find  $r$ .
26. The total area of a cylinder is  $90\pi$ . If  $h = 12$ , find  $r$ .
27. In rectangle  $ABCD$ ,  $AB = 10$  and  $AD = 6$ .
- The rectangle is rotated in space about  $\overline{AB}$ . Describe the solid that is formed and find its volume.
  - Answer part (a) if the rectangle is rotated about  $\overline{AD}$ .
28. a. The segment joining  $(0, 0)$  and  $(4, 3)$  is rotated about the  $x$ -axis, forming the lateral surface of a cone. Find the lateral area and the volume of this cone.
- b. Sketch the cone that would be formed if the segment had been rotated about the  $y$ -axis. Find the lateral area and the volume of this cone.
- c. Are your answers to parts (a) and (b) the same?
29. Each prism shown below is inscribed in a cylinder with height 10 and radius 6. Find the volume and lateral area of each prism.



Base is an equilateral triangle.



Base is a square.



Base is a regular hexagon.