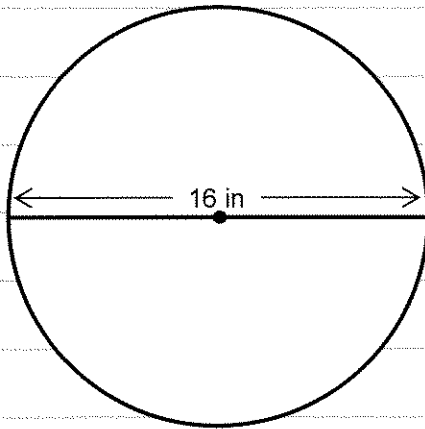
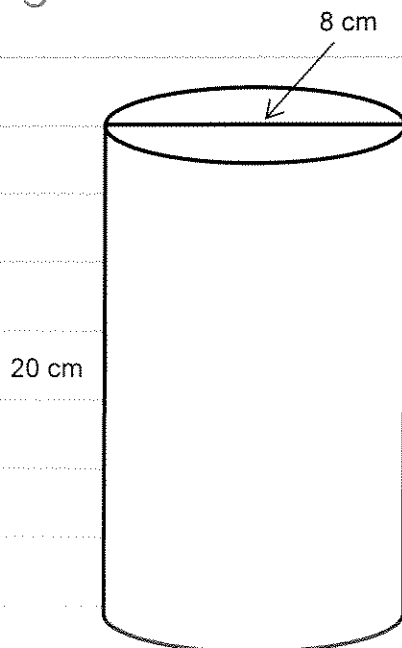


# Circles, Cylinders, and Spheres

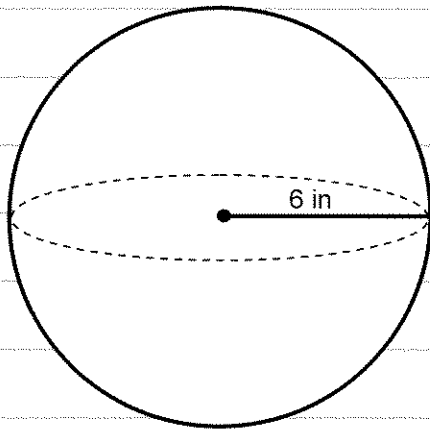
1. Find the circumference and the area of the circle below.



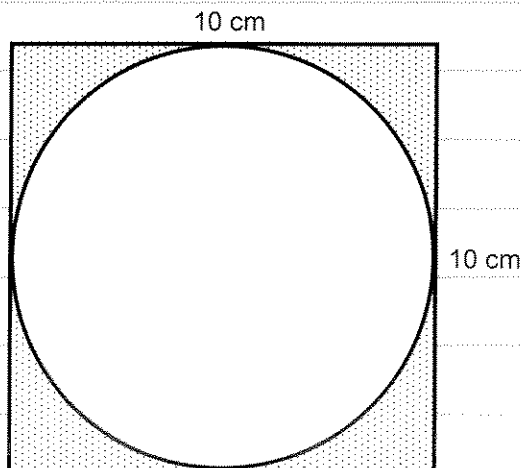
2. Find the volume of the right circular cylinder below.



3. Find the volume of the sphere.

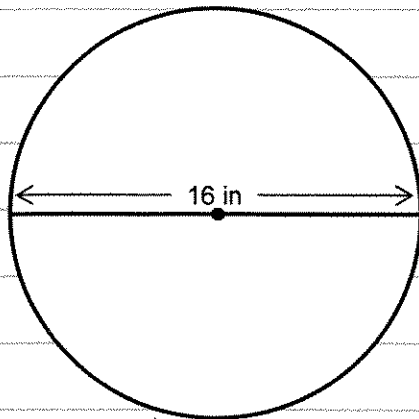


4. Find the area of the shaded region indicated in the figure below.



# Circles, Cylinders, and Spheres

1. Find the circumference and the area of the circle below.



$$d = 16 \text{ in}$$
$$r = \frac{1}{2}(16 \text{ in}) = \underline{8 \text{ in}}$$

$$C = 2\pi r$$

$$C = 2\pi(8 \text{ in})$$

$$C = 2 \cdot \pi \cdot 8 \text{ in}$$

$$C = 16\pi \text{ in} \approx 50.24 \text{ in}$$

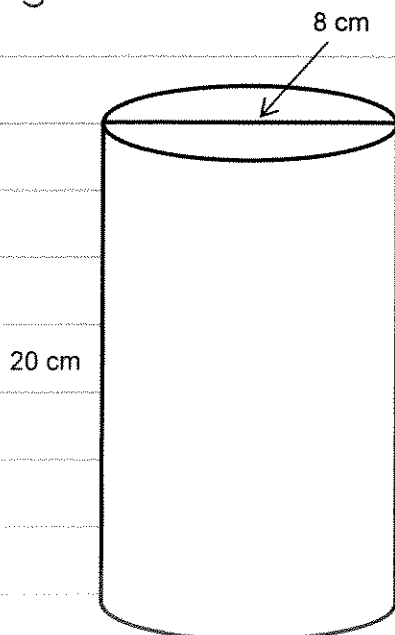
$$A = \pi r^2$$

$$A = \pi(8 \text{ in})^2$$

$$A = \pi \cdot 64 \text{ in}^2$$

$$A = 64\pi \text{ in}^2 \approx \boxed{200.96 \text{ in}^2}$$

2. Find the volume of the right circular cylinder below.



$$d = 8 \text{ cm}$$

$$r = \frac{1}{2}(8 \text{ cm})$$

$$\underline{r = 4 \text{ cm}}$$

$$V = \pi r^2 h$$

$$V = \pi(4 \text{ cm})^2(20 \text{ cm})$$

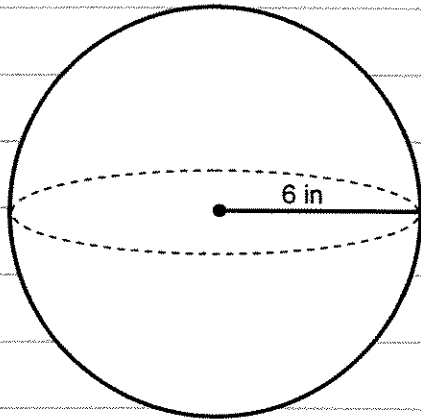
$$V = \pi \cdot 16 \text{ cm}^2 \cdot 20 \text{ cm}$$

$$V = \pi \cdot 16 \cdot 20 \text{ cm}^3$$

$$V = 320\pi \text{ cm}^3$$

$$\approx \boxed{1004.8 \text{ cm}^3}$$

3. Find the volume of the sphere.



$$r = 6 \text{ in}$$

$$V = \frac{4}{3} \pi r^3$$

$$V = \frac{4}{3} \pi (6 \text{ in})^3$$

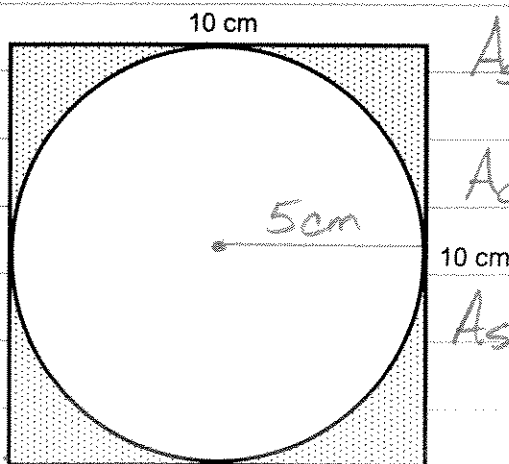
$$V = \frac{4}{3} \pi \cdot 216 \text{ in}^3$$

$$V = \frac{4}{3} \cdot \frac{72}{1} \pi \text{ in}^3$$

$$V = 288 \pi \text{ in}^3$$

$$\approx \boxed{904.32 \text{ in}^3}$$

4. Find the area of the shaded region indicated in the figure below.



$$A_{\text{square}} = S^2 = (10 \text{ cm})^2 = 100 \text{ cm}^2$$

$$A_{\text{circle}} = \pi r^2 = \pi (5 \text{ cm})^2 = 25\pi \text{ cm}^2$$

$$A_{\text{shaded}} = A_{\text{square}} - A_{\text{circle}}$$

$$= 100 \text{ cm}^2 - 25\pi \text{ cm}^2$$

$$\approx \boxed{21.5 \text{ cm}^2}$$