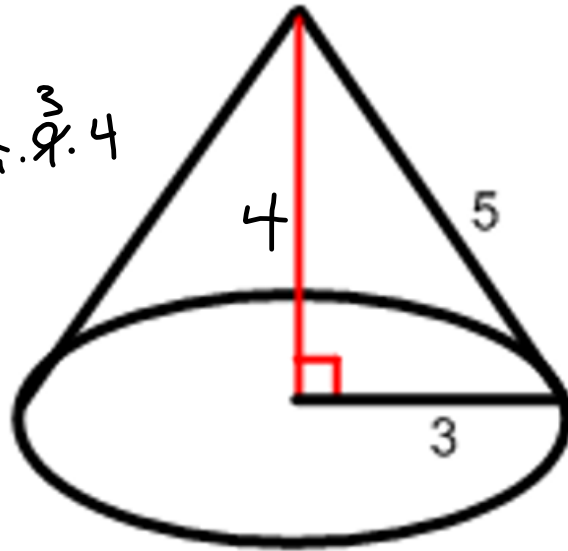


Bell Work

Find the volume

$$V = \frac{1}{3} \pi r^2 h$$
$$\frac{1}{3} \pi 3^2 \cdot 4 = \frac{1}{3} \pi \cdot 9 \cdot 4$$
$$37.68 \text{ m}^3$$
$$12 \pi \text{ m}^3$$



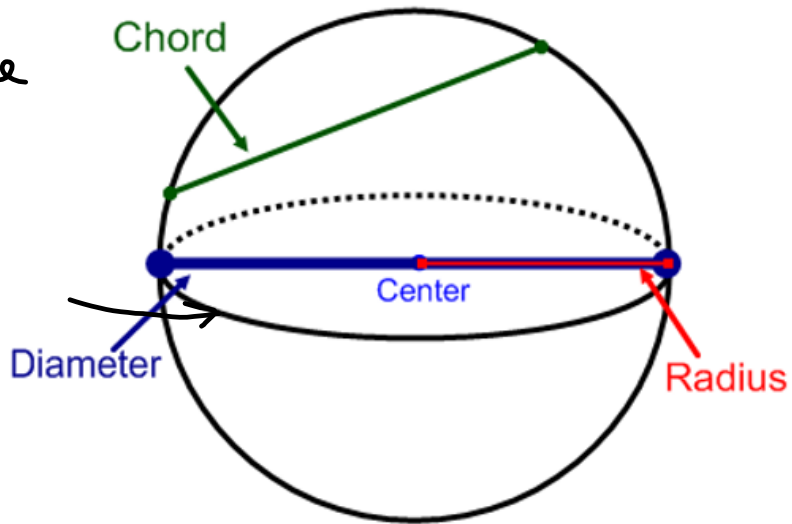
10.3 Volumes of Spheres

Obj: Students will be able to find volume of spheres.

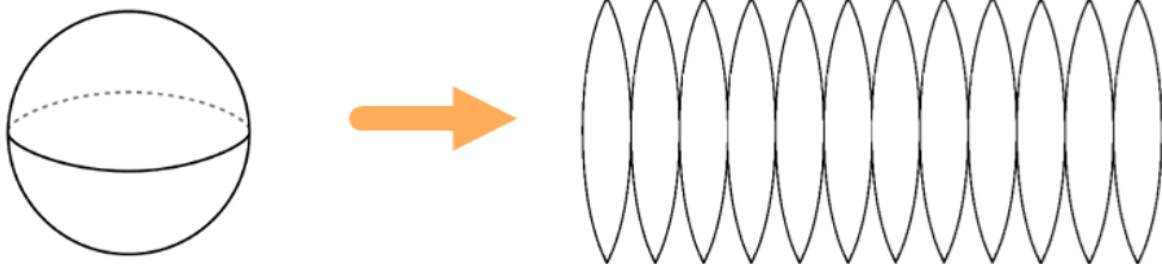
Spheres

- A sphere is the set of all points in space equidistant from a given point. This point is called the center of the sphere.

Great Circle

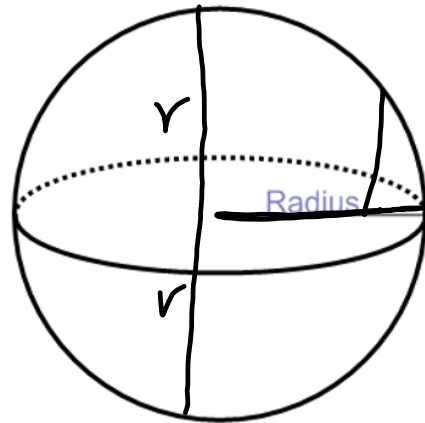


The net of a sphere:



Volume of a Sphere

$$V = \left(\frac{4}{3}\right)\pi r^3$$

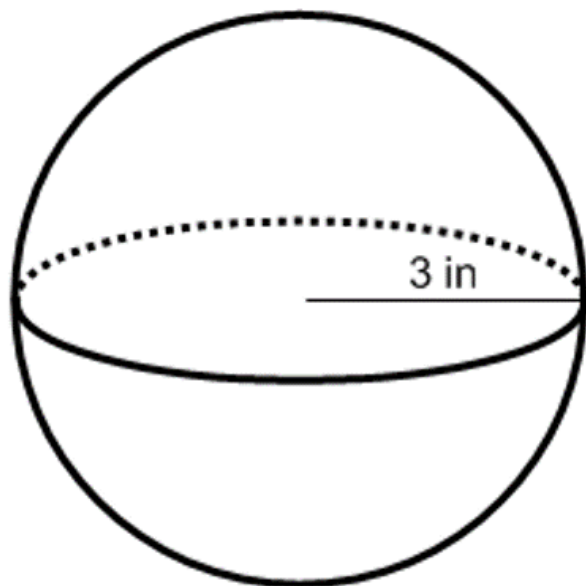


r = radius of sphere

Example

What is the volume?

$$\begin{aligned} V &= \frac{4}{3}\pi r^3 \\ &= \frac{4}{3}\pi (3)^3 \\ &= 36\pi \text{ in}^3 \end{aligned}$$



Example

What is the volume?

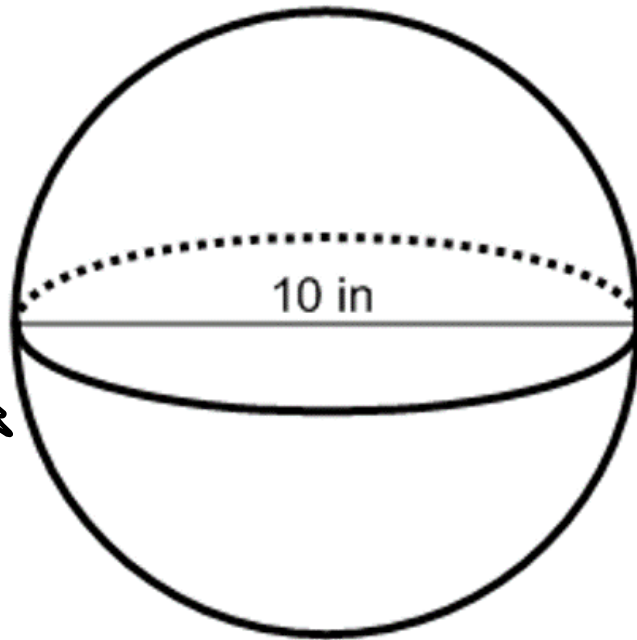
$$V = \frac{4}{3} \pi 5^3$$

$$\frac{4}{3} \pi \cdot 125$$

$$\frac{500\pi}{3}$$

$$523.333\text{in}^3$$

$$523.598\text{in}^3$$

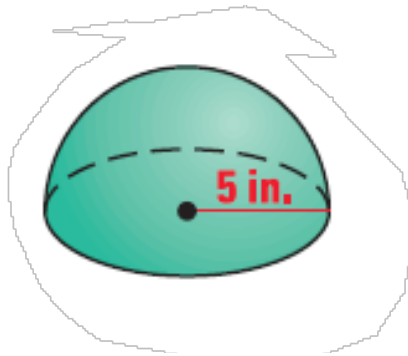


How do you think we would find the volume of a hemisphere?

$$\left(\frac{4}{3} \pi 5^3\right) \frac{1}{2}$$

$$\frac{500\pi}{3} \cdot \frac{1}{2}$$

$$\frac{250\pi}{3}$$



$$V = \frac{\frac{4}{3} \pi r^3}{2} = \frac{2}{3} \pi r^3$$

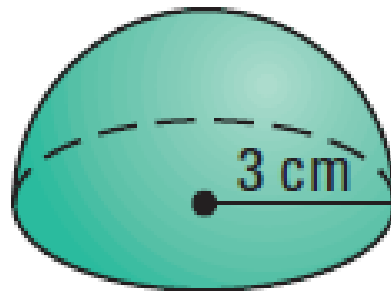
Handwritten notes in red:
 $\frac{2}{3} \pi r^3$
 $\frac{1}{2}$

What is the volume of the hemisphere?

$$V = \frac{2}{3} \pi r^3$$

$$= 18 \pi \text{ cm}^3$$

$$56.52 \text{ cm}^3$$



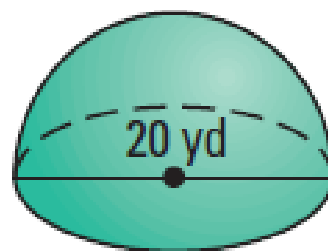
What is the volume of the hemisphere?

$$V = \frac{2000 \pi}{3} \text{ yd}^3$$

$$\frac{2}{3} \pi (10)^3$$

$$\frac{2 \pi (1000)}{3}$$

$$\frac{2000 \pi}{3}$$



We can find the volume of spheres or hemispheres when given circumference or area of the great circle.

Remember: $C = 2\pi r$ $A = \pi r^2$

You will need to solve for the radius so you can use the volume formula.

Find the volume of the sphere if:

a. the circumference of the great circle is 22 in

$$C = 22 \text{ in} \quad r = \frac{11}{\pi} \quad V = \left(\frac{4}{3}\right)\pi (3.503)^3$$

$$2\pi \cdot r = \frac{22}{2} \quad r = 3.503 \quad 179.965 \text{ in}^3$$

$$\pi r = 11$$

b. the area of the great circle is 35 m²

$$35 = \pi r^2 \quad r = 3.338 \quad 155.714 \text{ m}^3$$

$$\frac{35}{\pi} = \frac{\pi r^2}{\pi} \quad \sqrt{11.146} = r$$

Find the volume of the hemisphere if:

- a. the circumference of the great circle is 18 ft

- b. the area of the great circle is 40 in^2