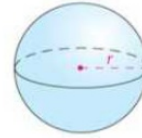


4.5 Volume of Spheres

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

r : radius



Examples: Find the volume of the following spheres. Leave answers in terms of π and round to the nearest hundredth.

1) $r = 3 \text{ cm}$

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

$$= \frac{4}{3} \cdot \pi \cdot 3^3$$

$$= \frac{4}{3} \cdot \pi \cdot 27$$

$$= 36\pi$$

$$v = 36\pi \text{ cm}^3 \approx 113.10 \text{ cm}^3$$

2) $d = 10 \text{ ft}$

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

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

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

$$= 166.67\pi$$

$$v = 166.67\pi \approx 523.60 \text{ ft}^3$$

Examples: Find the volume of the following hemispheres. Leave answers in terms of π and round to the nearest hundredth.

3) $r = 8 \text{ in}$

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

$$= \frac{4}{3} \cdot \pi \cdot 8^3$$

$$= \frac{4}{3} \cdot \pi \cdot 512$$

$$= 341.33\pi$$

$$v = 341.33\pi \text{ in}^3 \approx 1072.33 \text{ in}^3$$

4) $d = 20 \text{ mm}$

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

$$= \frac{4}{3} \cdot \pi \cdot 10^3$$

$$= \frac{4}{3} \cdot \pi \cdot 1000$$

$$= 1333.33\pi$$

$$v = 1333.33\pi \text{ mm}^3 \approx 4188.79 \text{ mm}^3$$

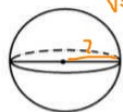
You Try ☺ Find the volume. Leave answers in π form and then round to the nearest hundredth.

A)



$r = 4 \text{ cm}$

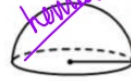
B)



$d = 14 \text{ ft}$

$$V = \frac{4}{3} \pi \cdot 7^3$$

$$= \frac{4}{3} \pi \cdot 343$$



$r = 5 \text{ in}$

Volume of sphere!

$$\frac{\frac{4}{3} \pi \cdot 5^3}{2}$$

$$= \frac{\frac{4}{3} \pi \cdot 125}{2}$$

$$\pi \cdot 4^3$$

$$\pi \cdot 64$$

$$V = 85.33 \pi \text{ cm}^3$$

$$\approx 268.08 \text{ cm}^3$$

$$V = 457.33 \pi \text{ ft}^3$$

$$\approx 1436.76 \text{ ft}^3$$

$$V = 83.33 \pi \text{ in}^3$$

$$\approx 261.80 \text{ in}^3$$

Ex #5: The radius of a sphere is 2.8 yds. Calculate its volume in π form & to the nearest hundredth.

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

$$= \frac{4}{3} \cdot \pi (2.8)^3$$

$$\approx 29.27 \pi \text{ yds}^3$$

$$V = 29.27 \pi \text{ yds}^3$$

$$\approx 91.95 \text{ yds}^3$$

Ex #6: The area of the great circle of a sphere is $144\pi \text{ cm}^2$. What is the volume of the sphere in π form and rounded to the nearest hundredth place?

$$A = \pi r^2$$

$$\frac{144\pi}{\pi} = \frac{\pi r^2}{\pi}$$

$$\sqrt{144} = \sqrt{r^2}$$

$$12 = r$$

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

$$= \frac{4}{3} \pi \cdot 12^3$$

$$= 2304 \pi$$

$$V = 2304 \pi \text{ cm}^3 \approx 7,238.23 \text{ cm}^3$$

You Try ☺ The diameter of a sphere is 15 ft. Find its volume in π form & to the nearest hundredth

$$r = 7.5$$

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

$$= \frac{4}{3} \cdot \pi \cdot 7.5^3$$

$$V = 562.5 \pi \text{ ft}^3$$

$$\approx 1,767.15 \text{ ft}^3$$