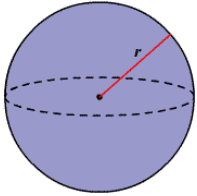


The Sphere

During math 8 and 9 you studied the prism, pyramid, cylinder and cone ...

1 key shape remains



The only component that matters is the radius leading to 2 formulae

$$\text{Surface area} = 4\pi r^2 \qquad \text{Volume} = \frac{4}{3}\pi r^3$$

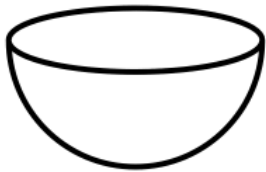
1) Find the volume and surface area of a sphere with diameter 12 m

$$R = 6m \qquad SA = 4\pi(6)^2 \qquad SA = 144\pi m^2$$

Notice leaving the π keeps answers neat and tidy

$$V = \frac{4}{3}\pi(6)^3 \qquad V = 288\pi m^3$$

2) Find the total surface area if the radius is 12 cm



Area = top + $\frac{1}{2}$ sphere

$$A = \pi(12^2) + \frac{1}{2}(4\pi(12)^2)$$

$$A = 144\pi + 288\pi \quad \text{or} \quad A = 432\pi cm^2$$

3) A sphere has a surface area of $100\pi m^2$, find its volume

$$\text{Need } r \qquad 100\pi = 4\pi r^2 \rightarrow 25 = r^2 \text{ thus } r = 5 \qquad V = \frac{4}{3}\pi(5)^3 \qquad V = \frac{500\pi}{3} m^3$$

4) A sphere has a surface area of $504\pi cm^2$, find its radius in simplest radical form

$$504\pi = 4\pi r^2 \qquad 126 = r^2 \qquad r = \sqrt{126} \qquad 126 = 7 \times 2 \times 3 \times 3 \qquad r = 3\sqrt{14} cm$$

5) A sphere has a surface area of $1440\pi cm^3$, find its radius in simplest radical form

$$1440\pi = \frac{4}{3}\pi r^3 \qquad 1080 = r^3 \qquad r = \sqrt[3]{1080} \qquad 1080 = 8 \times 135 \\ = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \qquad r = 6\sqrt[3]{5}$$

6) ^{silo} If $r = 4 m$ and $h = 10 m$, how much grain will the Silo hold?



Cylinder + $\frac{1}{2}$ sphere

$$V = \pi(4^2)(10) + \left(\frac{1}{2}\right)\frac{4}{3}\pi(4)^3 \qquad V = 160\pi + \frac{160}{3}\pi \text{ thus } V = \frac{640}{3}\pi m^3$$