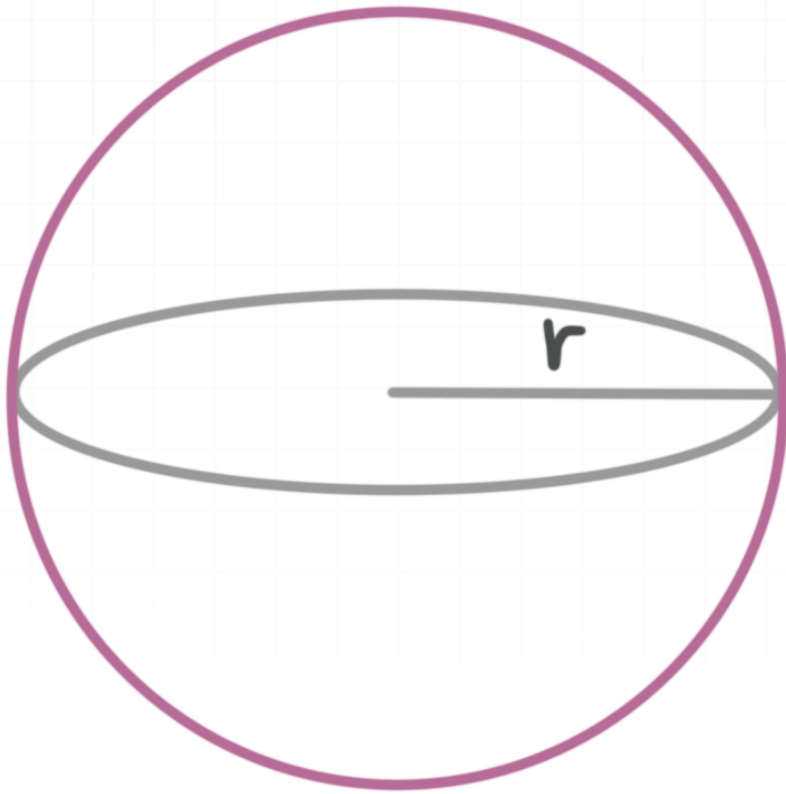


Volume/surface area of spheres

In this lesson we'll look at the volume and surface area of spheres. A **sphere** is a perfectly round ball; it's the three-dimensional version of a circle.



Volume and surface area

The volume of a sphere is given by

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

The symbol π is used for exact answers and $\pi \approx 3.14$ is used for approximate answers.

The surface area of a sphere is given by

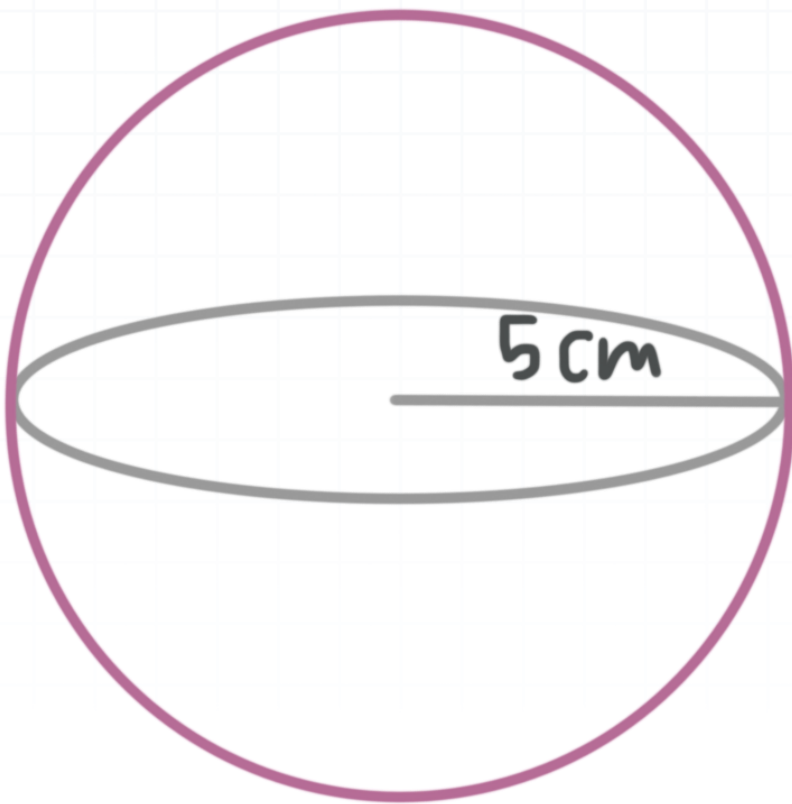


$$S = 4\pi r^2$$

Let's do a few examples.

Example

What is the surface area of the sphere?



Use the formula for surface area, and plug in the value of the radius.

$$S = 4\pi r^2$$

$$S = 4\pi(5 \text{ cm})^2$$

$$S = 100\pi \text{ cm}^2$$



Let's try one with volume.

Example

What is the volume of a sphere with a diameter of 50 cm?

The formula for volume is

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

We're given the diameter, so we need to divide by 2 to get the radius.

$$r = \frac{d}{2} = \frac{50 \text{ cm}}{2} = 25 \text{ cm}$$

Plugging into the formula for volume, we get

$$V = \frac{4}{3}(3.14)(25 \text{ cm})^3$$

$$V = \frac{4}{3}(3.14)(15,625 \text{ cm})^3$$

$$V = 65,416.67 \text{ cm}^3$$

