

## Propagated Error and Relative Error

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

A measuring device measures the radius of a sphere to be **2.4 cm**.

The device has a potential *error in measurement* of **0.02 cm**.

Find the *propagated error* in calculating the **volume** of the sphere.

Let  $x = 2.4 \text{ cm}$   $\Leftarrow$  Measured value

$\Delta x = 0.02 \text{ cm}$   $\Leftarrow$  error in measurement

$V(x + \Delta x) - V(x) = \Delta V$   $\Leftarrow$  propagated error  
can be closely estimated by  $dV$



A measuring device measures the radius of a sphere to be **2.4 cm**.

The device has a potential *error in measurement* of **0.02 cm**.

Find the *propagated error* in calculating the **volume** of the sphere.



A measuring device measures the side length of a cube to be 4.2 in.

The device has a potential *error in measurement* of 0.01 in.

Find the *propagated error* in calculating the volume of the cube.



The radius of a circle is found to be 42 feet, with a possible error of 1.4 feet.

Find the *propagated error* in calculating the area of the circle.