Answer on Question 48234, Physics, Mechanics | Kinematics | Dynamics |

Question:

If an error in the measurement of radius of a sphere is 2% then the error in the determination of volume of sphere will be?

Solution:

Let's suppose, that exact radius of a sphere is 1, so with 2% error of measurement we obtain approximated radius 1.02. To estimate the errror in determination of volume of sphere we use a formula for percent error:

$$\delta = 100 \cdot \left| \frac{V_{exact} - V_{approx}}{V_{exact}} \right| = 100 \cdot \left| \frac{\frac{4}{3} \cdot \pi \cdot 1^3 - \frac{4}{3} \cdot \pi \cdot 1.02^3}{\frac{4}{3} \cdot \pi \cdot 1^3} \right| = 100 \cdot \left| \frac{1 - 1.061208}{1} \right| = 100 \cdot 0.061208 = 6.12\%$$

Answer:

An error in the determination of volume of sphere will be 6.12%