

$V = \frac{4}{3}\pi r^3$, where r is the radius, in centimeters. By approximately how much does the volume of a sphere increase when the radius is increased from 1.0 cm to 1.2 cm? (use 3.14 for π)

Solution.

Calculate the volume of spheres for two different radii and then find differences ΔV between them:

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

$$V_1 = \frac{4}{3}\pi r_1^3 \quad V_2 = \frac{4}{3}\pi r_2^3$$

$$\Delta V = V_2 - V_1 = \frac{4}{3}\pi(r_2^3 - r_1^3) = \frac{4}{3} \cdot 3.14 \cdot (1.2^3 - 1^3) \approx 3$$

Answer: the volume of a sphere increased approximately for 3 cm^3 .