

PRACTICE PROBLEM SET 18

Use the differential formulas in this chapter to solve these problems. The answers are in Chapter 21.

1. Approximate $\sqrt{25.02}$. 5.002
2. Approximate $\sqrt[3]{63.97}$. 3.999375
3. Approximate $\tan 61^\circ$. 1.802
4. Approximate $(9.99)^3$. 997
5. The side of a cube is measured to be 6 in. with an error of ± 0.02 in. Estimate the error in the volume of the cube. $\pm 2.16 \text{ in}^3$
6. When a spherical ball bearing is heated, its radius increases by 0.01 mm. Estimate the change in volume of the ball bearing when the radius is 5 mm. $\pi \approx 3.142 \text{ mm}^3$
7. A side of an equilateral triangle is measured to be 10 cm. Estimate the change in the area of the triangle when the side shrinks to 9.8 cm. -1.732 cm^2
8. A cylindrical tank is constructed to have a diameter of 5 meters and a height of 20 meters. Find the error in the volume if:
 - (a) the diameter is exact, but the height is 20.1 meters; and 1.963 m^3
 - (b) the height is exact, but the diameter is 5.1 meters. 15.708 m^3

Work
in
mm

KEY

