

So

$$\frac{\Delta Q}{Q} = 0.112 = 11.2\%$$

Now, the radius of the sphere is

$$R = \left(\frac{3M}{4\pi\rho} \right)^{1/3} = (Q)^{1/3}$$

So the uncertainty in radius R can be found via

$$\frac{\Delta R}{R} = \frac{\Delta Q}{Q} \cdot \frac{1}{3}$$

$$= (0.112) \cdot \frac{1}{3} = 0.037$$

Only 3.7%

Now we can finally determine the uncertainty in the radius, ΔR :

$$\Delta R = R (0.037)$$

$$= (6.34 \text{ m})(0.037) = 0.23 \text{ m}$$

Thus, the radius of the gold sphere is

$$R = 6.34 \pm 0.23 \text{ m} \quad \text{or} \quad 6.3 \pm 0.2 \text{ m}$$