A piece of gold weigh 10 g in air and 9 g in water .what is volume of cavity (19.3 g/cm^3)

For piece of gold in air:

$$m = \rho_g V_g = 10\ g$$

where ρ_g – density of gold, V_g – volume of gold

For piece of gold in air (assuming Archimedes' principle that the upward buoyant force is equal to the weight of the fluid that the body displaces):

$$m - \rho_w (V_g + V_c) = 9\ g$$

where ρ_w – density of water, V_c – volume of cavity.

Substitute from first $gV_g = \frac{mg}{\rho_g}$ to second:

$$m - \rho_w \frac{m}{\rho_g} - \rho_w V_c = 9\ g$$

Or:

$$10g\left(1 - \frac{\rho_w}{\rho_g}\right) - 9g = \rho_w V_c$$

$$V_c = \frac{10g\left(1 - \frac{\rho_w}{\rho_g}\right) - 9g}{\rho_w} = \frac{10g\left(1 - \frac{1}{19.3}\right) - 9g}{1\frac{g}{cm^3}} = 0.48\ cm^3$$

Answer: $0.48\ cm^3$