Answer on Question #47950 – Physics – Other

a metallic block in the form of a cube 40 cm on each edge has density of 8.54 g/cm³. find its total mass and weight density

Solution:

$a = 0.4m - length\ of\ the\ side\ of\ the\ cube;$

$\rho = 8540\frac{kg}{m^3} - density\ of\ the\ cube;$

Formula for the density:

$$\rho = \frac{m}{V} \quad (1)$$

Total volume of the cube:

$$V = a^3 \quad (2)$$

$(2) in (1)$:

$$m = \rho a^3 = 8540\frac{kg}{m^3} \cdot (0.4\ m)^3 = 550\ kg$$

Formula for the weight density:

$$\gamma = \frac{mg}{V} = \rho \cdot g = 8540\frac{kg}{m^3} \cdot 9.8\frac{N}{kg} = 83700\frac{N}{m^3}$$

Answer: total mass: $m = 550\ kg$

Weight density: $\gamma = 83700\frac{N}{m^3}$