$$F_B = mg - \rho_{water} \cdot V_{object} \cdot g$$

$$F_B = \rho_{object} \cdot V_{object} \cdot g - \rho_{water} \cdot V_{object} \cdot g$$

$$F_B = (\rho_{object} - \rho_{water}) \cdot V_{object} \cdot g$$

As $\rho_{object} > \rho_{water}$, the piece of steel will not float (its volume will be under the water surface). So:

$$m = \rho_{object} \cdot V_{object} \Leftrightarrow V_{object} = \frac{m}{\rho_{object}} = \frac{200}{7860} = 0.02544529 \quad 3 \text{ m}^3$$

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