

8. According to Archimedes' principle the buoyant force is equal to the weight of the displaced fluid. We know the volume of fluid displaced, so we can calculate the mass of the displaced fluid by the second method used to solve Problem 5.

$$m = d V$$

$$m = (1000 \text{ kg} / \text{m}^3) (0.6 \text{ m}^3)$$

$$m = 600 \text{ kg}$$

The weight is calculated as the product of mass times the acceleration due to gravity as

$$\text{wt} = m g$$

$$\text{wt} = (600 \text{ kg}) (9.8 \text{ m} / \text{s}^2)$$

$$\text{wt} = 5880 \text{ N}$$

The buoyant force is equal to the weight of the displaced fluid, so the buoyant force is 5880 N. Because the problem stated that the object was floating, the buoyant force must be equal to the weight of the object. Therefore the weight of the object is also 5880 N.