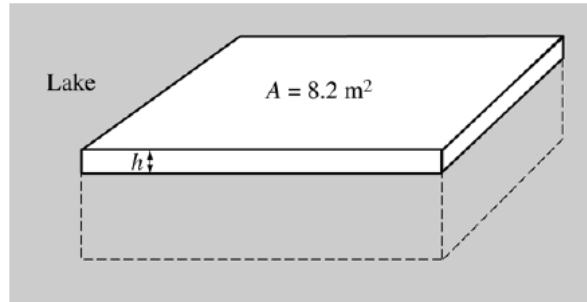


2005 AP[®] PHYSICS B FREE-RESPONSE QUESTIONS



Note: Figure not drawn to scale.

5. (10 points)

A large rectangular raft (density 650 kg/m^3) is floating on a lake. The surface area of the top of the raft is 8.2 m^2 and its volume is 1.80 m^3 . The density of the lake water is 1000 kg/m^3 .

- Calculate the height h of the portion of the raft that is above the surrounding water.
- Calculate the magnitude of the buoyant force on the raft and state its direction.
- If the average mass of a person is 75 kg , calculate the maximum number of people that can be on the raft without the top of the raft sinking below the surface of the water. (Assume that the people are evenly distributed on the raft.)