

Problem 1: Will a ball as massive as the cruise ship sink or float? Explain your answer.

Problem 2: Find the volume of the solid aluminum block that weighs 120 N in air. Note that the density of the aluminum is equal to $2,710 \text{ kg/m}^3$.

Problem 3: Passengers attempt to escape from a damaged ship 15 m below the surface. Determine the force they must apply to push out a 0.88 m^2 hatch at that depth. Note that the density of the ocean water is equal to 1025 kg/m^3 .

Problem 4: What is the density of a 1.5 m^3 ingot that has a buoyant force of 143 N?

Problem 5: Water flows through a pipe with a radius of 4.0 cm with a speed of 8.0 cm/s. It then enters a smaller pipe of radius 2.0 cm. Find the speed of the water as it flows through the smaller pipe.