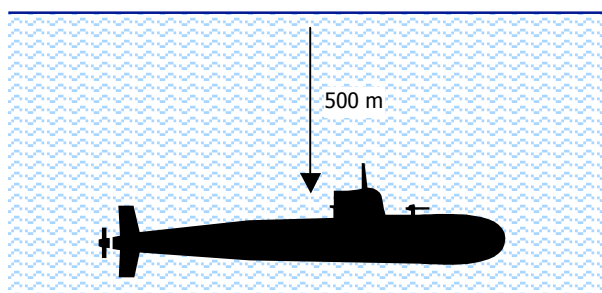


FORMAL HOMEWORK EXERCISE

Mechanics & Properties of Matter

Homework 7 - Pressure And Density

- The stools in the physics rooms have four round feet, each with a surface area of approximately 1 cm^2 . The physics teachers complain that when people swing onto just one leg of the stool, the flooring under it is damaged. For the purposes of this problem, take the average mass of a pupil to be 60 kg.
 - Calculate the area of one of the stool's feet in m^2 .
 - Calculate the pressure exerted on the floor when all four feet are on the ground (as they should be!)
 - Calculate the pressure exerted on the floor when just one foot is on the ground.
- What is the mass of a block of steel that is $2 \text{ cm} \times 2 \text{ cm} \times 2 \text{ cm}$? (Density of steel = 8000 kgm^{-3})
- A submarine, mass 50 000 kg, is 500 m under the surface of a freshwater loch. The density of the water is 1000 kgm^{-3} . When the submarine's air tanks are full, it experiences an upthrust of 550 000 N.



- Calculate the pressure from the water at this depth.
- Will the submarine rise to the surface, sink, or float at a constant depth? Explain your answer.

HOMEWORK DEADLINE:

WEDNESDAY 26 NOVEMBER