

Problems Class 10

The wings of a model aeroplane are attached at 90° to the plane's fuselage. Each of the two wings is 10 cm long and 2 cm wide and shaped such that air has to flow a distance of 2.4 cm when flowing over the wing's top surface and 2.1 cm when flowing over its lower surface. What is the lift that the wings generate through the Bernoulli effect when the aeroplane is flying horizontally at a speed of 2 m/s? (The density of air is 1.2 kg/m^3 .)



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A cylindrical cocktail glass of mass 250 g, height 12 cm and outer diameter 6 cm is floating vertically in a large washing up bowl. How much of the glass is above the water? Prove that the glass undergoes simple harmonic motion if it is raised slightly then released. What is the frequency of the resulting oscillations? (The density of water is 1000 kg/m^3 .)

