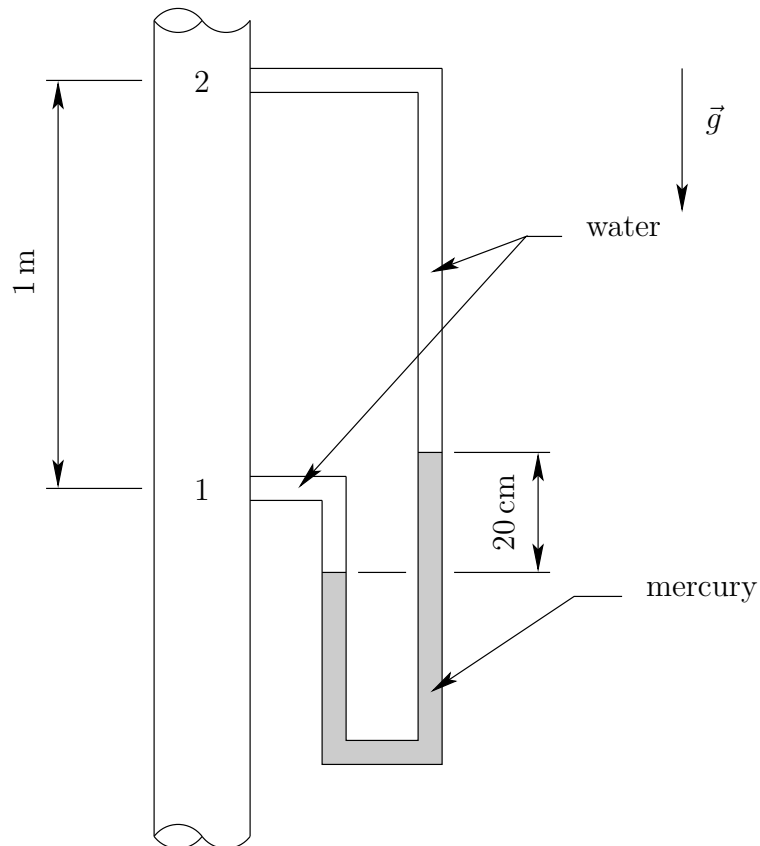


University of Saskatchewan
Department of Mechanical Engineering
ME 215.3 Midterm Examination
March 3, 2003

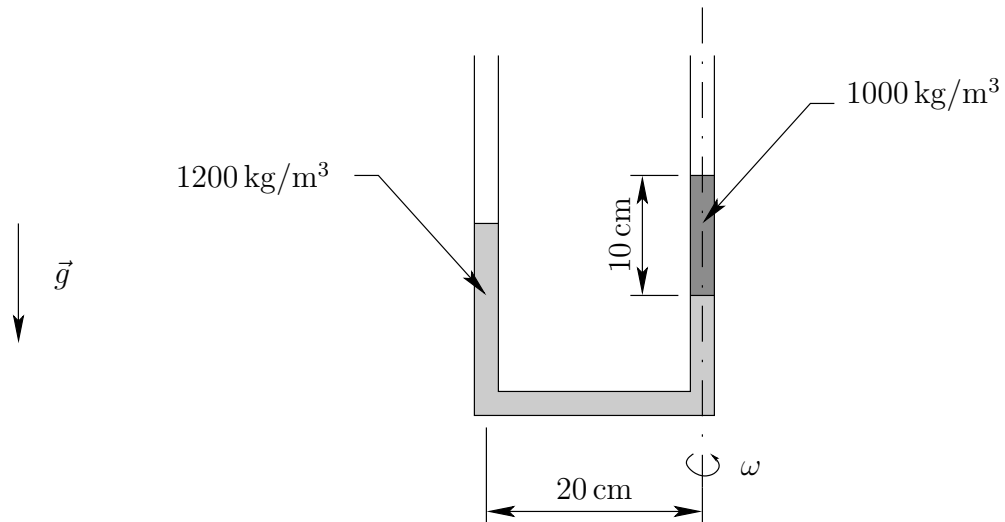
Closed book exam.
Formula sheet provided.
This exam contains THREE questions

Instructor: J.D. Bugg
Time: 1.5 hours
Total Marks: 60

- (10) 1. A U-tube manometer is used to measure the pressure difference between two points in a vertical section of pipe. The fluid in the pipe is water ($\rho = 1000 \text{ kg/m}^3$). The manometer fluid is mercury (s.g.=13.56). What is the pressure difference $P_1 - P_2$ in Pa?



- (25) 2. A U-tube manometer contains two fluids with different densities as shown. The fluid positions shown in the diagram are for the case when the tube is not spinning. It is then spun around the axis shown until the liquid level in both legs is equal? Find ω .



- (25) 3. Two circular coaxial jets of incompressible liquid with speed V collide as shown. The interaction region is open to atmosphere. Liquid leaves the interaction region as a conical sheet. Obtain an expression for the angle θ of the resulting flow in terms of d_1 and d_2 .

