Tutorial Quiz-2 **PHYS 101 : Week of September 24, 2007**

Two poblems to be done during the first hour on the black board and two to be handed in for marking

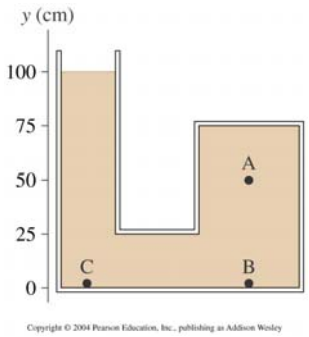
For the problems to be marked each problem is worth 10 points
A student may discuss the problems with other students but may not copy from others.

Problem 15.37

Your science teacher has assigned you the task of building a water barometer. You've learned that the pressure of the atmosphere can vary by as much as 5% from 1 standard atmosphere as the weather changes.

(a) What minimum height must your barometer have?
(b) One stormy day the TV weather person says, " The barometric pressure this afternoon is low 29.25 inches". What is the height of the water in your barometer?

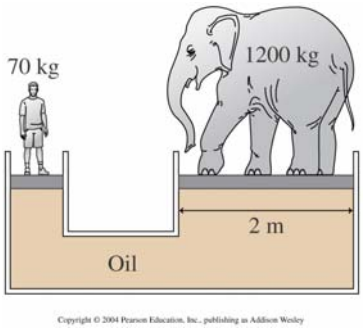
Problem 15.38



The container shown in the Figure 15.38 is filled with oil. It is open to the atmosphere on the left.

(a) What is the pressure at point A?
(b) What is the pressure difference between points A and B? Between points A and C?

Problem 15.39



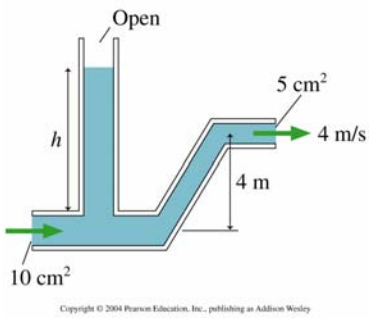
a) A 70 kg student balances a 1200 kg elephant on a hydraulic lift. What is the diameter of the piston the student is standing on?
b) A second 70 kg student joins the first student. How high do they lift the elephant?

Problem 15.41

A U-shaped tube, open to the air on both ends, contains mercury. Water is poured into the left arm until the water column is 10.0 cm deep. How far upward from its initial position does the mercury in the right arm rise?

Problem 15.61

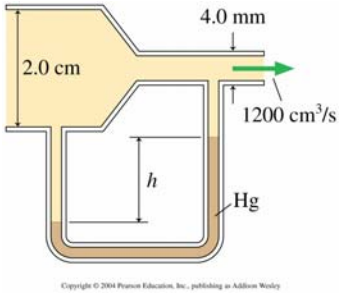
Water flows from the pipe shown in the figure with a speed of 4.0 m/s.



a) What is the water pressure as it exists into the air?
b) What is the height *h* of the standing column of water?

Problem 15.64

Air flows through this tube at a rate of 1200 cm^3/s. Assume that air is an ideal fluid. What is the height *h* of mercury in the right side of the U-tube?



Problem 15.67

A 4.0-mm diameter hole is 1.0 m below the surface of a 2.0-m diameter tank of water.

a) What is the volume flow rate through the hole, in L/min?
b) What is the rate, in mm/min, at which the water level in the tank will drop if the water is not replenished?