E. P. 324.3 Winter 1996
Assignment #7 Due Mar. 12, 1996

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8.27 Water at 20°C flows at 3 m/s in a 20-cm smooth pipe. What must be the velocity of air (standard atmospheric pressure) at 30°C in a 10-cm smooth pipe for the two flows to be dynamically similar? If the pressure change for the water flow was measured as 2.0 kPa over a given length of pipe, what pressure change should you get for the air flow with the same length of pipe?

8.36 The moment acting on a submarine rudder is studied by a 1/60 scale model. If the test is made in a water tunnel and if the moment measured on the model is 3 m · N when the fresh-water speed in the tunnel is 10 m/s, what are the corresponding moment and speed for the prototype? Assume the prototype operates in sea water. Assume T = 10°C for both the fresh water and the sea water.