
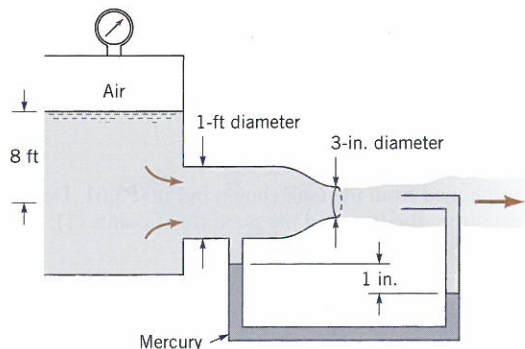


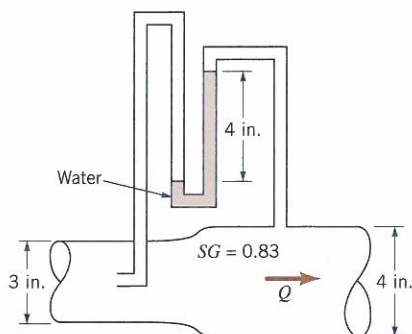
3.65  Water flows steadily from a large, closed tank as shown in Fig. P3.65. The deflection in the mercury manometer is 1 in. and viscous effects are negligible. (a) Determine the volume flowrate. (b) Determine the air pressure in the space above the surface of the water in the tank.



■ Figure P3.65

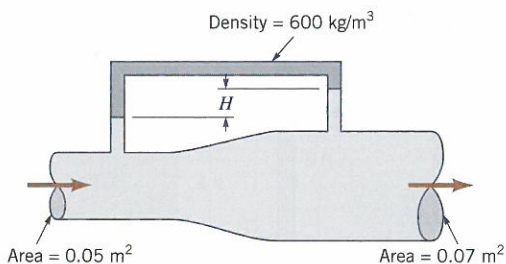
3.66 Carbon dioxide flows at a rate of 1.5 ft³/s from a 3-in. pipe in which the pressure and temperature are 20 psi (gage) and 120 °F into a 1.5-in. pipe. If viscous effects are neglected and incompressible conditions are assumed, determine the pressure in the smaller pipe.

3.67 Oil of specific gravity 0.83 flows in the pipe shown in Fig. P3.67. If viscous effects are neglected, what is the flowrate?



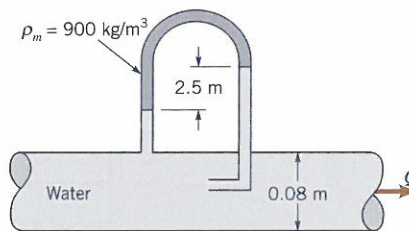
■ Figure P3.67

3.68 Water flows steadily through the variable area pipe shown in Fig. P3.68 with negligible viscous effects. Determine the manometer reading, H , if the flowrate is 0.5 m³/s and the density of the manometer fluid is 600 kg/m³.



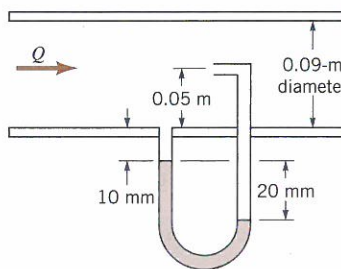
■ Figure P3.68

3.69 Determine the flowrate through the pipe in Fig. P3.69.




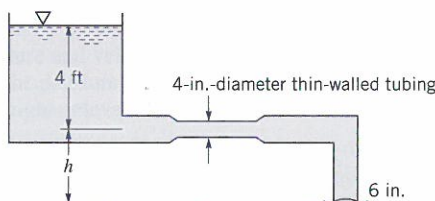
■ Figure P3.69

3.70 The specific gravity of the manometer fluid shown in Fig. P3.70 is 1.07. Determine the volume flowrate, Q , if the flow is inviscid and incompressible and the flowing fluid is (a) water, (b) gasoline, or (c) air at standard conditions.





■ Figure P3.70

3.71  Water flows steadily with negligible viscous effects through the pipe shown in Fig. P3.71. It is known that the 4-in.-diameter section of thin-walled tubing will collapse if the pressure within it becomes less than 10 psi below atmospheric pressure. Determine the maximum value that h can have without causing collapse of the tubing.



■ Figure P3.71

3.72  Helium flows through a 0.30-m-diameter horizontal pipe with a temperature of 20 °C and a pressure of 200 kPa (abs) at a rate of 0.30 kg/s. If the pipe reduces to 0.25-m-diameter, determine the pressure difference between these two sections. Assume incompressible, inviscid flow.

3.73  Water is pumped from a lake through an 8-in. pipe at a rate of 10 ft³/s. If viscous effects are negligible, what is the pressure in the suction pipe (the pipe between the lake and the pump) at an elevation 6 ft above the lake?

3.74 Air is drawn into a small open-circuit wing tunnel as shown in Fig. P3.74. Atmospheric pressure is 98.7 kPa (abs) and the temperature is 27 °C. If viscous effects are negligible, determine the pressure at the stagnation point on the nose of the airplane. Also determine the manometer reading, h , for the manometer attached to the static pressure tap within the test section of the wind tunnel if the air velocity within the test section is 50 m/s.