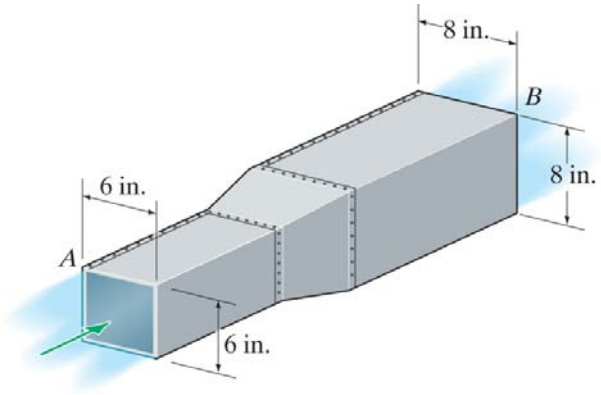
CHEN.3030 Fluid Mechanics

Homework Assignment #6 Spring 2017

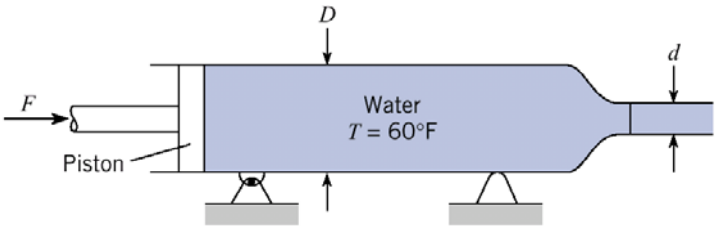
The Bernoulli Equation

1. Air at 100 ^{o}F flows through the square horizontal duct section at Point A at 200 ft/s under a pressure of 1.50 psi.

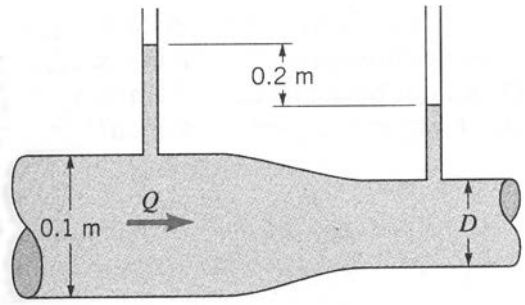
Determine the pressure in the square duct section at Point B.



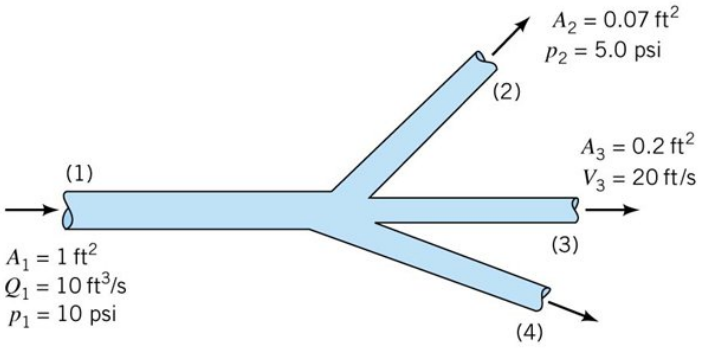
2. Water is forced out of the cylinder into the atmosphere as shown in the diagram. If the piston is driven at a speed of 4 ft/s, with d = 2 inches and D = 4 inches, estimate the force F needed to drive the piston.



3. Water flows through a section of pipe with a contraction as shown in the diagram. For the given 0.2 m difference in the manometer level, determine the flow rate, Q, in the pipe if D = 0.05 m. Neglect viscous effects.



4. Water flows through the horizontal branching pipe segment shown at a rate of 10 ft^3/s. If viscous effects are negligible, determine the water speed at Section 2, the pressure at Section 3, and the volume flow rate at Section 4.



5. Oil of specific gravity 0.83 flows in the pipe section shown. If viscous effects are assumed to be negligible, estimate the flow rate Q.