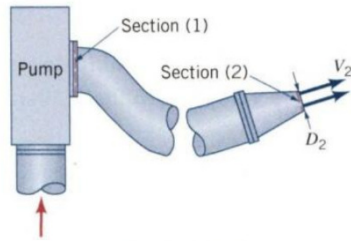
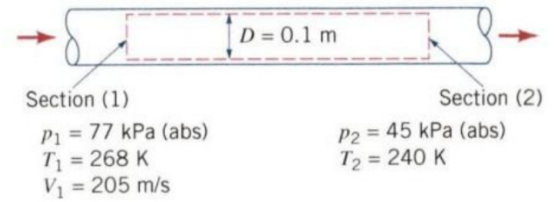


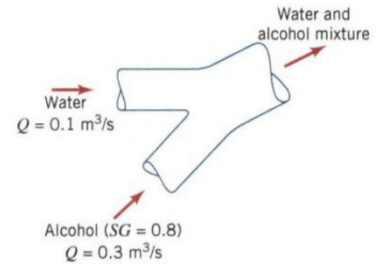
5.1.6 WP The pump shown in **Fig. P5.1.6** produces a steady flow of 10 gal/s through the nozzle. Determine the nozzle exit diameter, D_2 , if the exit velocity is to be $V_2 = 100$ ft/s.



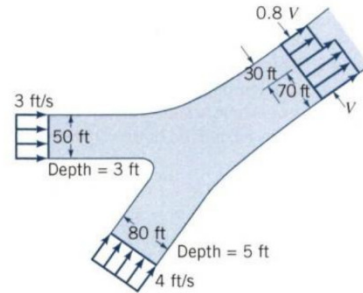
5.1.9 WP Air flows steadily between two cross sections in a long, straight section of 0.1-m inside diameter pipe. The static temperature and pressure at each section are indicated in **Fig. P5.1.9**. If the average air velocity at section (1) is 205 m/s, determine the average air velocity at section (2).



5.1.14 WP SS Water at $0.1 \text{ m}^3/\text{s}$ and alcohol ($SG = 0.8$) at $0.3 \text{ m}^3/\text{s}$ are mixed in a y-duct, as shown in **Fig. P5.1.14**. What is the average density of the mixture of water and alcohol?



5.1.19 WP Two rivers merge to form a larger river, as shown in **Fig. P5.1.19**. At a location downstream from the junction (before the two streams completely merge), the nonuniform velocity profile is as shown and the depth is 6 ft. Determine the value of V .



5.1.22 WP As shown in **Fig. P5.1.22**, at the entrance to a 3-ft-wide channel the velocity distribution is uniform with a velocity V . Further downstream, the velocity profile is given by $u = 4y - 2y^2$, where u is in ft/s and y is in ft. Determine the value of V .

