Q1 *Oil (s = 0.92) of viscosity of 0.000 38 $m^2/s$ flows in a 100-mm-diameter pipe at a rate of 0.64 L/s. Find the head loss per unit length.*

Q2 *Two long pipes convey water between two reservoirs whose water surfaces are at different elevations. One pipe has a diameter twice that of the other; both pipes have the same length and the same value of f. If minor losses are neglected, what is the ratio of the flow rates through the two pipes?*

Q3 *Find the magnitude and direction of the flow in network lines ab and bc (Fig. P8.118) after making two sets of corrections. The numbers on the figure are the K values of each line; take n = 2.0. Start by assuming initial flows as follows: 0.3 $m^3/s$ in lines ab and cd, 0.2 $m^3/s$ in lines ac ae bc.*

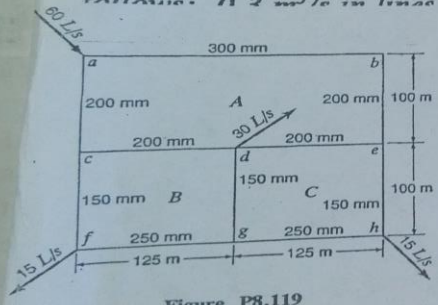


Figure. P8.119

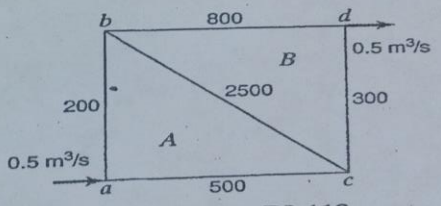


Figure P8.118

Q4 *Carry the solution for the pipe network of Fig. P8.119 through four trials, to find the flow in each pipe. For simplicity, take n = 2.0 and use the value of f for complete turbulence, as given by Eq. (8.54). All pipes are cast iron, and are at the same elevation. For initial flows, assume only values of 30, 15, and 0 L/s (the zeros in dg and fh. If the pressure head at a is 40 m, find the pressure head at d (which might represent a fire demand, for example) neglecting velocity heads.*