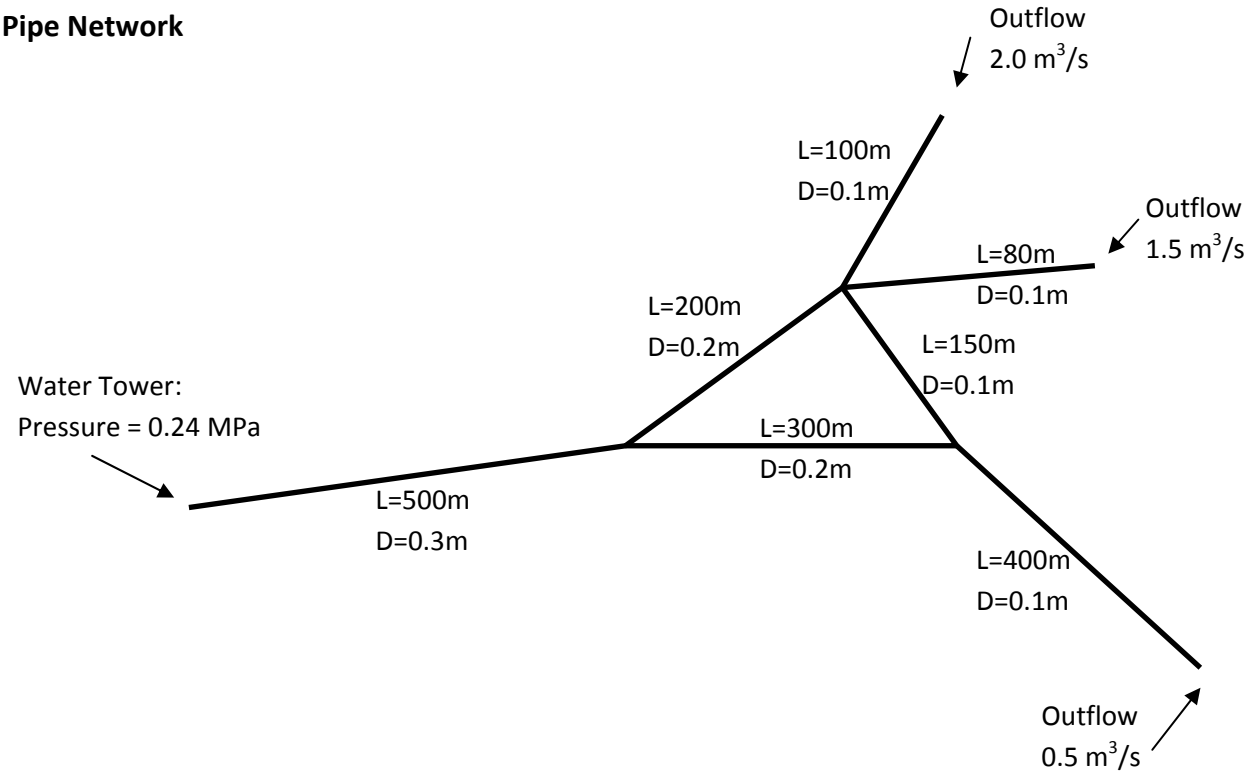
Hand-in Assignment 1
Flow in Water Pipe Network

Pipe Network



The flow in a water pipe network as shown in the figure above is to be analyzed. D is the pipe diameter in meter, L is the length and the viscosity of water is μ=0.001 Pa s.

a. Calculate, using CALFEM, the pressure at nodes 5, 6 and 7 of the pipe network.
b. Determine the amount and direction of the flow in each pipe section.
c. Which pipe section has the largest pressure loss?
d. Assume now that the pressure at node 1 is unknown and instead only the inflow is known to be 4 m^3/s. Describe what happens when you try to solve the system of equations. Why is there a problem?

The solution should consist of a first part where the problem is stated and the results are summarized and a second part where the calculations are presented. The second part could be an m-file with comments and result values. Note that a figure showing the numbering of elements and degrees of freedom must be included.

Equivalent FE-model