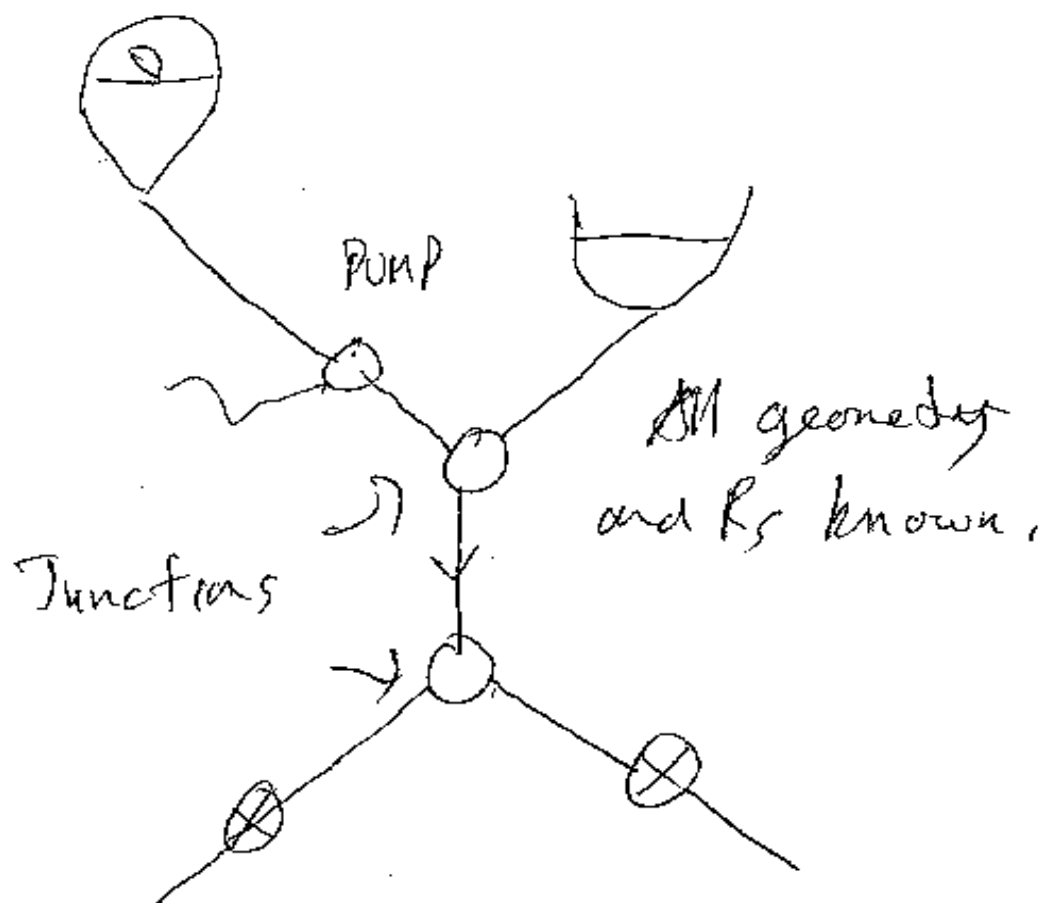


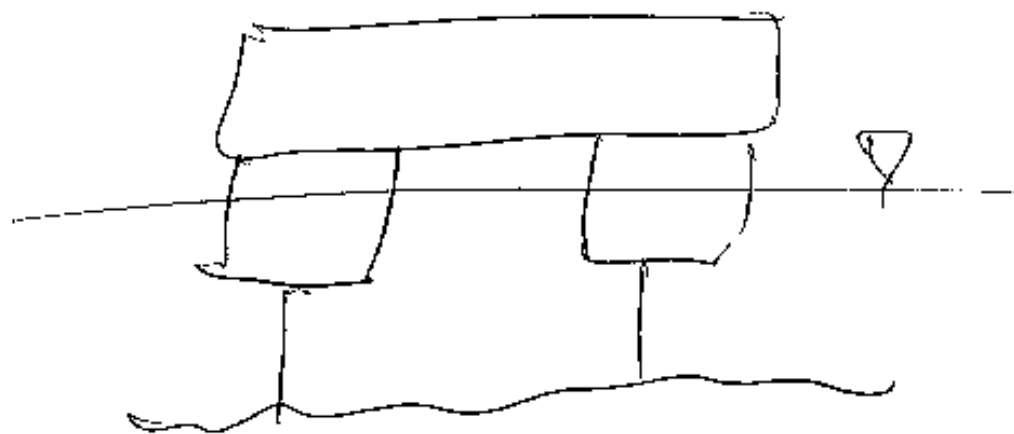
PIPE NETWORK FLOW



How would you find flows in this network?

ROLL STABILITY OF A TLP

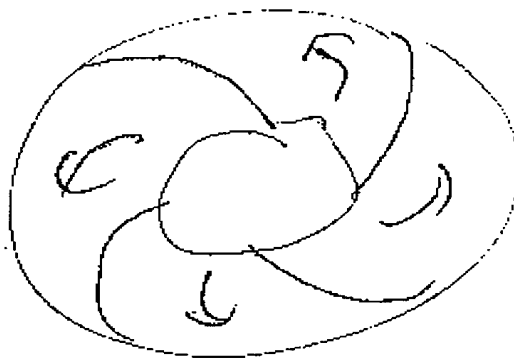
A tension leg platform or TLP uses forces in vertical cable mooring lines to suppress heave motions due to waves.



Does this system have a Metacenter? Can it roll over?

PUMP CHARACTERISTICS

Consider a centrifugal pump
such as that in sketch,



Data for pump are

Inlet

$$r = 0.15 \text{ m}$$

$$d = 0.05 \text{ m}$$

$$\beta = 45^\circ$$

Outlet

$$r = 0.25 \text{ m}$$

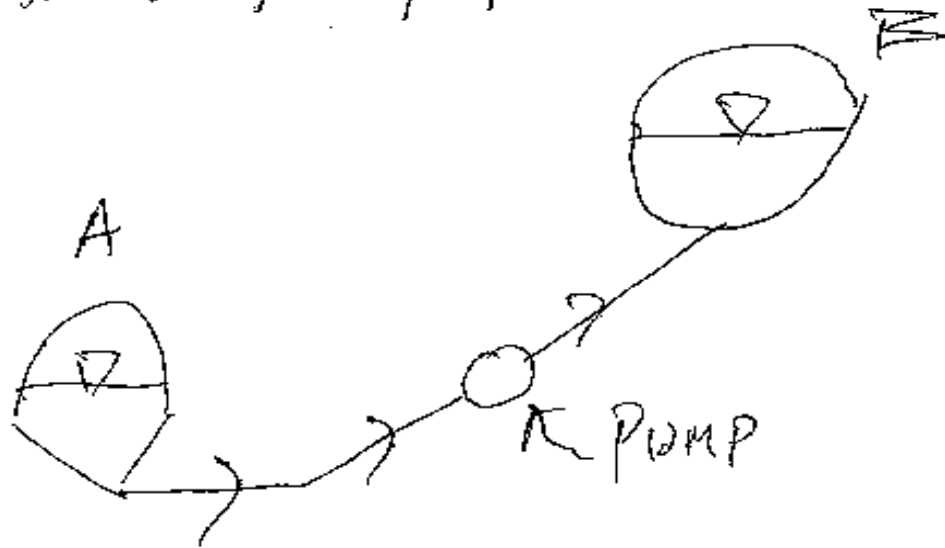
$$d = 0.025 \text{ m}$$

$$\beta = 30^\circ$$

Determine the theoretical head versus flow characteristic of the pump. Assume that rotor speed N is 2000 RPM. Repeat calculation for case where N is 1000 RPM. Plot H versus Q for each case. Calculate C_H and C_Q for each case and plot C_H versus C_Q on same plot. Repeat calculations for case where $\beta_1 = \beta_2 = 90^\circ$.

PIPE FLOW ON MOON

Water has to be pumped along the single pipe shown in sketch,



Data for pipe are:

Length 1000m Diameter 0.25m

$P_A = 1 \text{ BAR}$ $P_B = 5 \text{ BAR}$

$Z_A = 0 \text{ m}$ $Z_B = 100 \text{ m}$

The pipe is located in a pressure dome on the Moon.
Derive the system demand equation, Determine the pump power required to pump 10 gpm, What type of pump is appropriate for this application? For this assume $N = 2000 \text{ RPM}$, The allowable NPSH for the pump on Earth is 5m, Where should pump be located on Moon to get this? Assume smooth pipe,