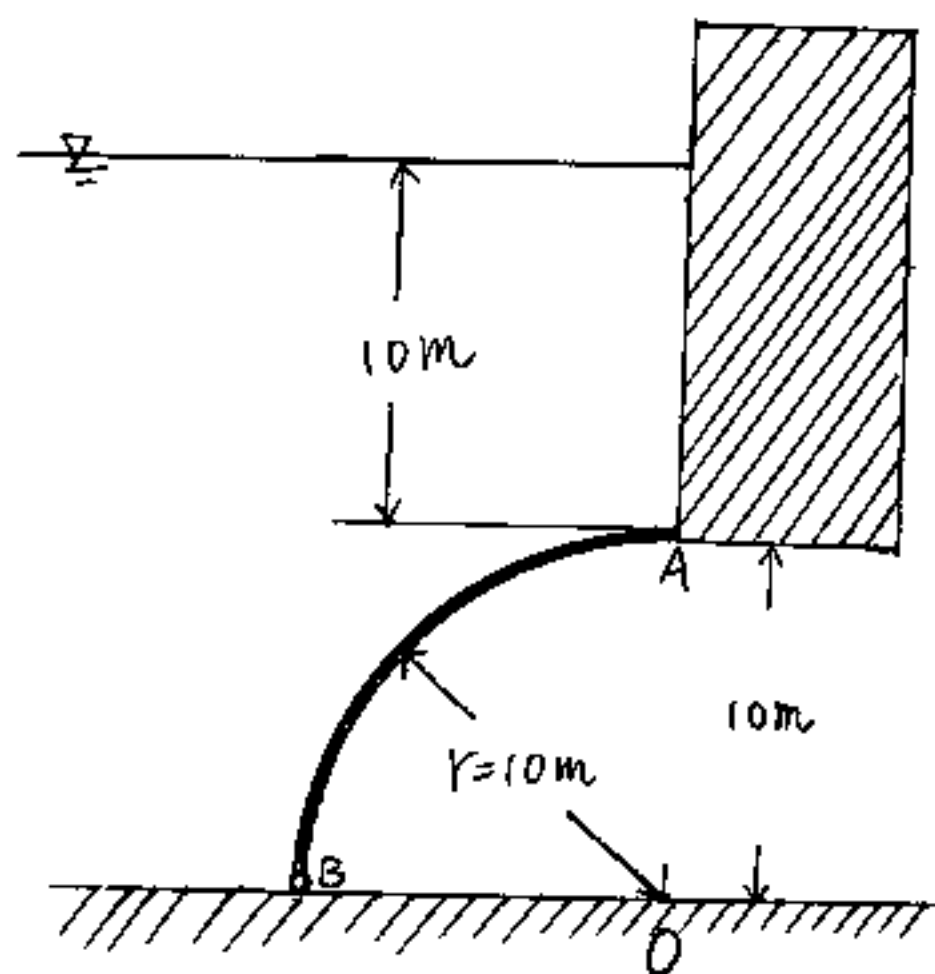1. The cylindrical gate AB in following figure is 1m wide into the paper and hinged at B. Assuming the point A is frictionless, please determine the reaction forces at A and B. Neglect the weight of gate.(25%)

Problem 1

2. A 1/300 scale model of a spillway is tested. The discharge in the model is $0.2\,m^3/sec$. To what prototype discharge does this correspond ? If it takes 15 min for a particle to float from one point to another in the prototype, how long would it take a similar particle to travel the corresponding path in the model ?(25%)

3. The Following tank is accelerated in the x-direction in such a way that the liquid surface does not change slop. What is the acceleration of the tank? (25%)
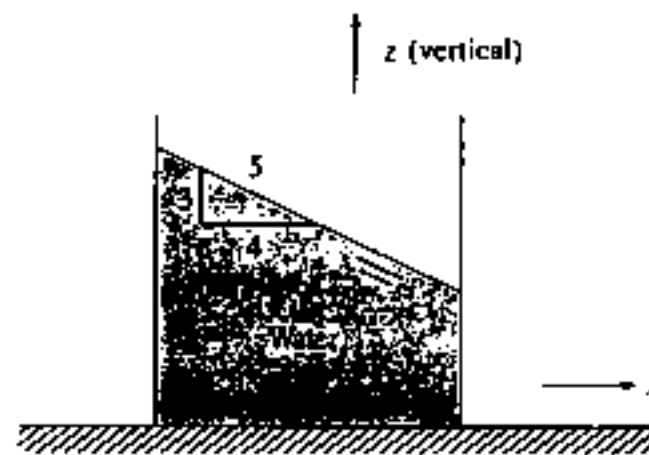
Problem 3

4. Steady flow initially occurs in the following 1-m steel pipe. There is a rapid-acting valve at the end of the pipe at point B, and there are pressure transducers at both points A and B. If the valve is closes at B and the p-versus-t traces are made ad show, estimate the initial discharge and the length L from A to B.(Hints: Assuming the pressure wave velocity for water is 1483m/sec) (25%)