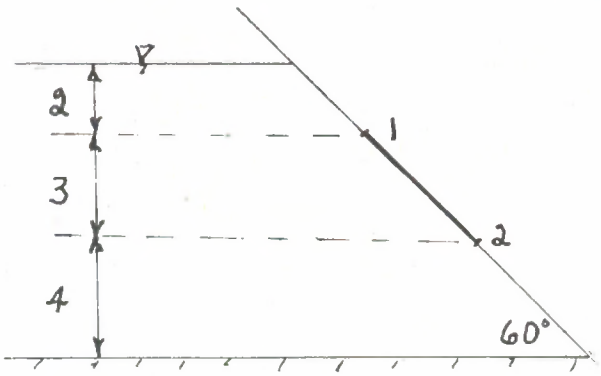
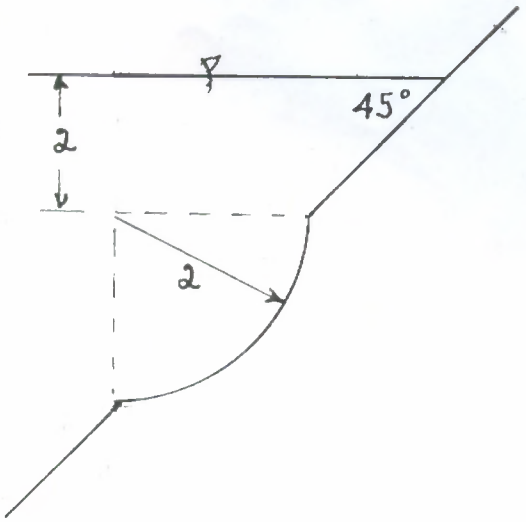
Extra Problems

1. Find the force and its location of the water acting on the door.
a) rectangular with w=3m
b) circular: $I_{x_c x_c} = \pi R^4 / 4$

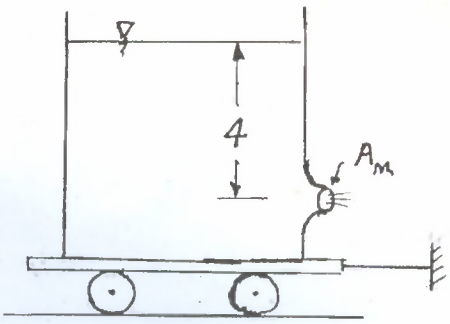


2. In the previous problem the rectangular door in part (a) is hinged at point 2 and a weight is hung on a cable which is attached at point 1. If the material of the weight has a specific gravity of 5, what is its volume to keep the door shut.

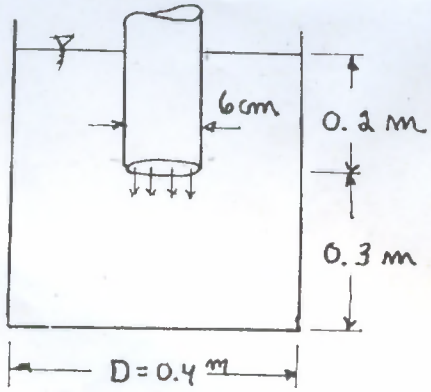
3. The quarter circular door is hinged at point 2. What is the force F to hold the door shut? W=3m.



4. Find the force in the cable holding the cart. $A_{nozzle} = 75cm^2$.



5. A 6cm diameter pipe discharges water at the $\dot{q} = 0.028m^3/s$ downward into the water in the tank. The pressure at the pipe exit is approximately the hydrostatic at the 0.2m depth. The tank weighs 300N. What is the vertical force to support the tank.



6. Water flows upward in the pipe and exits radially into the atmosphere from between the two circular disks. What is the vertical force on the assembly between 1 and 2.

$\dot{q} = 0.03\ m^3/s$