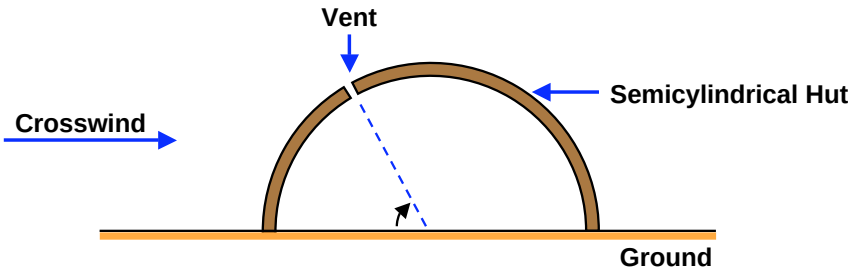
Problem 121A

A cylindrical artic hut is subjected to a crosswind as shown in the figure:



The interior of the hut is ventilated to the outside through a small vent at a position, θ, as indicated. Hence the pressure inside the hut (assumed uniform and constant) is the same as the pressure just outside the vent. Assuming potential flow over the hut find the angle, θ, at which the net vertical lift on the hut is zero. Neglect the thickness of the wall of the hut and assume that the vent has no effect on the exterior flow. Also assume that the air is incompressible.