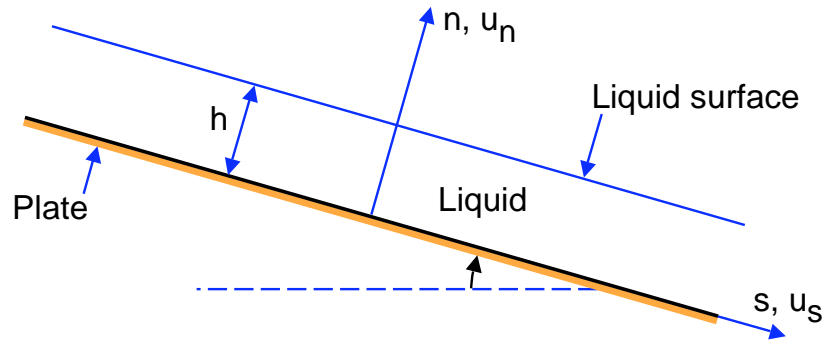## Problem 150E

A constant and uniform layer of Newtonian, viscous, incompressible liquid (dynamic viscosity, μ, and density, ρ) flows down a flat plate inclined at an angle, θ, to the horizontal:

The thickness of the layer is h and the flow is planar with velocity components as follows:

$$u_n = 0 \quad ; \quad u_s(n) = Cn(2h - n)$$

where C is a constant. Find

[a] An expression for C in terms of ρ, μ, θ and the acceleration due to gravity, g.

[b] The pressure acting on the plate if the atmospheric pressure is denoted by p_a.