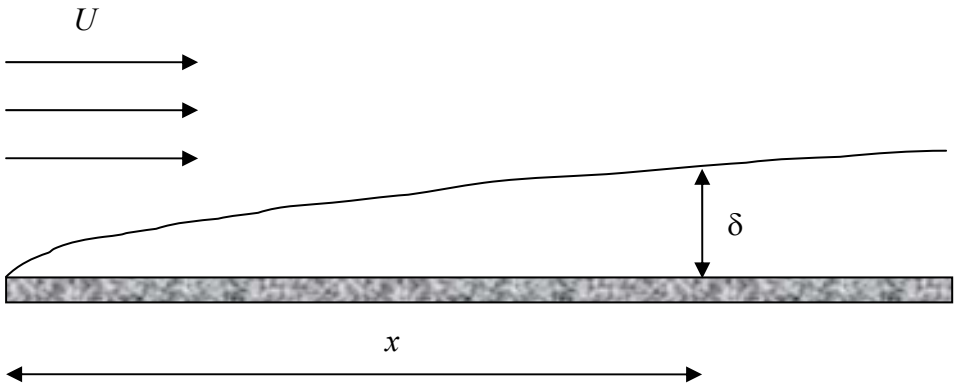
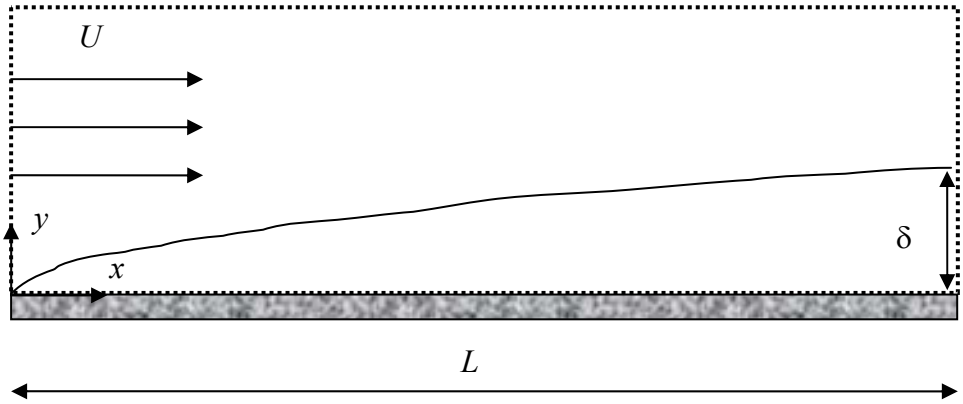
1. Dimensional analysis of boundary layer thickness: Consider a uniform flow *(U)* over a flat plate as follow:




a) List the relevant physical variables which are pertinent to the determination of boundary layer thickness at a downstream distance, *x*, measured from the leading edge.

b) Perform a dimensional analysis on your results in Part (a).

2. Control volume analysis of flat plate boundary layer: Consider a uniform flow *(U)* over a flat plate again.




Assume the velocity distribution within the boundary layer is given by:

$$\frac{u}{U} = \left(\frac{y}{\delta}\right)^{1/7}$$

Determine the total drag force on the flat plate of length *L* and width *w* (into the page).