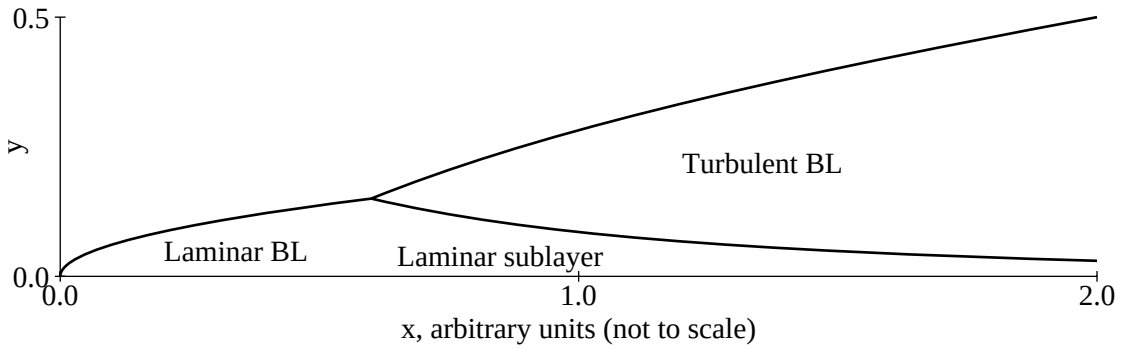
1. Laminar and turbulent boundary layers

   (a) Your velocity boundary layer sketch should have looked something like:



   (b) For laminar flow, $\delta_u \propto x^{0.5}$; for turbulent flow, $\delta_u \propto x^{0.8}$. The turbulent boundary layer grows faster because the turbulent eddies mix momentum much more effectively than viscosity "diffuses" it.

   (c) If the flow can be made laminar at a given Reynolds number, the drag force will be lower than for turbulent flow. This is evident from the f vs. Reynolds number curve for flow past a flat plate.

   Note that some people were confused by the decreasing nature of the f vs. Re curve. Although f is decreasing with Re, drag force is proportional to $fK = f \cdot \frac{1}{2}\rho U^2$, so for a given fluid and plate, drag force will increase with Reynolds number.