[NOTE:] Although we have separate prelab submissions, I worked extensively with **Andrew Binder** to complete this prelab, so that is the reason why our work shares relatively similar styles.

1 Problem 1: Brick Geometry

Consider the geometry of a ray of light incident on a rectangular brick of thickness t as shown. You may assume that the index of refraction of the surrounding air is 1. Determine z in terms of the lenghts t and y (you just need geometry for this part - no Snell's law is allowed)

Use propagation of errors to determine α_x as a function of θ_1 and $\alpha_{\theta 1}$. Then determine α_z as a function of t, y, α_t and α_y.

Show that the geometry of reflection and refraction implies that $\theta_1 = \theta_3 = \theta_4 = \theta_5$

Use Snell's law and your result from (a) to determine the index of refraction of the brick n_{brick} first in terms of x and z and then in terms of t, y and θ.