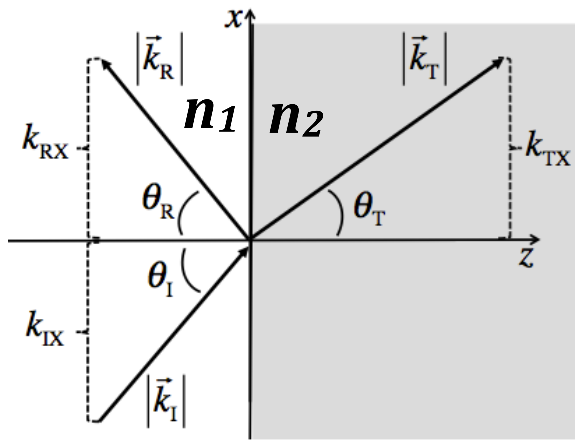
Snell's law

A. An EM plane wave traveling in the x-z plane (i.e., $\vec{k}_{\rm I} = k_{\rm IX}\hat{x} + k_{\rm IZ}\hat{z}$) is incident on a material at an angle $\theta_{\rm I}$ relative to the z-axis:

$$\vec{\mathbf{E}}_{\rm I}(\vec{r},t) = \vec{E}_{\rm I} \exp\left[i\left(\vec{k}_{\rm I}\cdot\vec{r} - \omega t\right)\right]$$

$$\vec{\mathbf{E}}_{\rm R}(\vec{r},t) = \tilde{\vec{E}}_{\rm R} \exp\left[i\left(\vec{k}_{\rm R}\cdot\vec{r} - \omega t\right)\right]$$

$$\vec{\mathbf{E}}_{\rm T}(\vec{r},t) = \vec{E}_{\rm T} \exp\left[i\left(\vec{k}_{\rm T}\cdot\vec{r} - \omega t\right)\right]$$



We argued from continuity of $E_{//}$ that $\vec{k}_I\cdot\vec{r} = \vec{k}_R\cdot\vec{r} = \vec{k}_{\rm T}\cdot\vec{r}$ for any **r** in the z=0 plane. (E.g. $\vec{r} = \hat{x}$)

I got briefly hung up on the algebra at the board last class, so let's work it out again:
Derive the following ratio for incident and transmitted wave angles.
(Express it first in terms of magnitudes of ***k*** *vectors, but then write it simply in terms of the index of refraction in the two regions, n_1 and n_2)*

$$\frac{\sin\theta_{\rm T}}{\sin\theta_{\rm I}} =$$