Problem 1 - polarization
Consider a wave travelling in the z direction whose electric field is given by
\[ E(z,t) = 3 \cos(\omega t - \beta z) a_x + C \cos(\omega t - \beta z + \phi) a_y. \]
Describe the polarization (e.g. linear, right circular, etc.) and on an xy plot sketch the locus of \( E(0,t) \) over a cycle for the following cases.

a) \( C = 4 \text{ V/m}, \phi = 0^\circ \)  
b) \( C = 3 \text{ V/m}, \phi = 45^\circ \)

Problem 2 - Arbitrary propagation angle
The direction of \( E \) and \( \gamma \) of a electromagnetic wave with \( \lambda = 500 \text{ nm} \) are shown below. The wave is traveling through air. The electric field has a magnitude of 30 V/m. What are the \( E \) and \( H \) phasors?

\[ \begin{align*}
\text{y axis is out of the page} 
\end{align*} \]