

Fields and Waves I, Fall 2000

Homework due Dec. 6, 2000

1. A plane wave with parallel polarization is incident at an angle of 45 degrees from air onto an ideal dielectric with $\epsilon_r = 4$.

- a) Find the transmission and reflection coefficients.
- b) What fraction of the incident power is reflected and what is transmitted?
- c) Repeat part a for perpendicular polarization.

2. A uniform plane wave in air is incident on a dielectric ($z \geq 0$) with $\epsilon_r = 2.5$. The wave is given by $E = 10 \cos(\omega t - 4x - 3z)\hat{a}_y$

Find

- a) the polarization of the wave,
- b) the angle of incidence,
- c) the reflected electric field
- d) the transmitted magnetic field.