

Homework 2.

- 1) A wave propagating in z-direction is described by $E = E_0 \cos(\omega t - kz)$ (V/m), where $\omega = 9 \times 10^{14}$ (rad/sec), and $k = 3 \times 10^6$ (1/m). Determine
 - (a) the wavelength λ
 - (b) the frequency f
 - (c) the phase velocity v
- 2) In free space, A plane wave propagating along z-direction is described by $E = E_0 \cos(\omega t - kz)$ (V/m), where $\omega = 6\pi \times 10^8$ (rad/sec). Determine
 - (a) the wavelength λ
 - (b) the frequency f
- 3) A plane wave propagating in a medium is $\vec{E}(z,t) = \hat{a}_x \cos(\omega t - kz)$ (V/m). If the medium is characterized by $\epsilon_r = 2$, $\mu_r = 2$, and the wavelength is $\lambda = 2$ (m). Determine
 - (a) the phase velocity v
 - (b) the frequency f
 - (c) the characteristic impedance of the medium η