EE324 Quiz # 8 Spring 2013

Closed Book

Name (Last, First) .....

The electric field phasor of a uniform plane is given by $\tilde{E} = \hat{y}10e^{j0.2z}$ (V/m).

1. Find the magnetic field phasor $\tilde{H}$.

$$\tilde{\mathbf{H}} = \frac{1}{\eta}(-\hat{\mathbf{z}}) \times \tilde{\mathbf{E}} = \frac{1}{\eta}(-\hat{\mathbf{z}}) \times \hat{\mathbf{y}}10e^{j0.2z}$$

2. Find the magnetic field $\vec{H}$.

$$\vec{H}(z,t) = \hat{x}\frac{10}{\eta}e^{j0.2z}$$

For a wave characterized by the electric field $\vec{E}(z,t) = \hat{x}3\cos(\omega t - kz) + \hat{y}4\cos(\omega t - kz - 135^0)$

1. Identify the polarization state
2. Sketch the locusof E(0,t).

$$\psi_0 = \tan^{-1}(a_y/a_x),$$
$$\tan 2\gamma = (\tan 2\psi_0)\cos\delta$$
$$\sin 2\chi = (\sin 2\psi_0)\sin\delta$$

a_x	a_y	δ	ψ_0	γ	χ	Polarization State
3	4	$-135°$	$53.13°$	$-56.2°$	$-21.37°$	Right elliptical

Right elliptical