Volviendo al primer inciso:

$$\frac{E_{to}}{E_{io}} = \frac{2\,(60\pi)\cos(36.87^\circ)}{60\pi\cos(36.87^\circ) + 120\pi\cos(17.46^\circ)}$$

$$\tau_\perp = \frac{E_{to}}{E_{io}} = 0.59 \Rightarrow E_{io} = \frac{E_{to}}{0.59} = \frac{11.65}{0.59} = 19.8\ V$$

+5

c.) $$\frac{E_{ro}}{E_{io}} = \Gamma_\perp \Rightarrow 1 + \Gamma_\perp = \tau_\perp$$

$$\Gamma_\perp = \tau_\perp - 1 = 0.59 - 1 = -0.41$$

$$E_{ro} = (-0.41)(19.8) = -8.2$$

$$\bar{E}_{rs} = -\hat{y}\,8.2\,e^{-j(3x-4z)}$$

$$\bar{E}_r(\bar{r},t) = -\hat{y}\,8.2\cos(\omega t - 3x + 4z)\ V/m$$

$$\omega = \beta_1 u_1 = \sqrt{3^2+4^2}\,c = 5c = 1.5\times10^9\ rad/s$$

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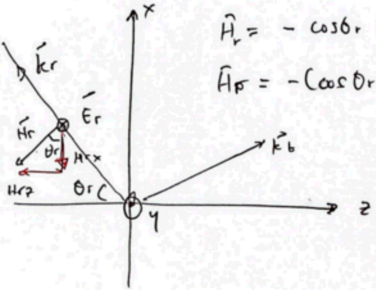
$$\bar{E}_r(\bar{r},t) = -\hat{y}\,8.2\cos(1.5\times10^9 t - 3x + 4z)\ V/m$$

d.)



$\hat{H}_r = -\cos\theta_r\,\hat{x} - \sin\theta_r\,\hat{z}$

$\hat{H}_r = -(\cos\theta_r\,\hat{x} + \sin\theta_r\,\hat{z})$

$$\vec{H}_r = -(0.8\hat{x} + 0.6\hat{z})\,\frac{\cancel{E_{ro}}^{\,8.2}}{\eta_0}\,e^{-j(3x-4z)}$$

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$$\vec{H}_r(\vec{r},t) = -(17.4\hat{x} + 13.1\hat{z})\cos(1.5\times10^9 t - 3x + 4z)\ \text{mA/m}$$

e.) $\vec{E}_{ts} = \hat{y}\,11.65\,e^{-j\vec{k}_t\cdot\vec{r}}$; $|\vec{k}_t| = \beta_2 = \dfrac{\omega}{u_2} = \dfrac{\omega}{\frac{1}{\sqrt{4\epsilon_0\mu_0}}}$

$\beta_2 = \dfrac{\omega}{c/2} = 10\ m^{-1}$

$\vec{k}_t = (\cos\theta_t\,\hat{z} + \sin\theta_t\,\hat{x})\,\omega$

$\vec{k}_t = 3\hat{x} + 9.54\hat{z}$

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$$\vec{E}_t(\vec{r},t) = 11.65\,\hat{y}\cos(1.5\times10^9 t - 3x - 9.54z)\ \text{mV/m}$$

f.) Su magnitud está dada, y su dirección es

$$\vec{P}^{\,t}_{prom} = \hat{k}_t = \cancel{\ }\cos\theta_t\,\hat{z} + \operatorname{sen}\theta_t\,\hat{x}$$

$$\hat{P}^{\,t}_{prom} = 0.3\,\hat{x} + 0.954\,\hat{z}$$

Así:

$$\vec{P}^{\,t}_{prom} = 0.36\,(0.3\hat{x} + 0.954\hat{z})$$

$$= 0.108\,\hat{x} + 0.34\,\hat{z}$$

+5