

EEL 3473
HOMEWORK #6
DUE: MONDAY, OCTOBER 19, 2009

1. A plane wave with time-domain electric field $\vec{E}(z,t) = A \sin(\omega t - kz) \hat{x}$ propagates in free space toward an infinite (in the x and y directions) sheet of conductor ($\sigma \gg \omega\epsilon$) located between $z = 0$ and $z = d$, where $d = 10\delta_s$ and δ_s is the skin depth in the conductor. Express the incoming plane wave as a phasor. Find both the phasor electric field and the time domain electric field for $z > d$, a region of free space. List any approximations or assumptions made. For copper, what fraction of the original amplitude of the wave A passes through the conductor? What fraction of the original wave power passes through the conductor? Where does the rest of the power go?

2. Problem 8.20, Ulaby pg 369