Electromagnetic Waves in Lossy Media

Reading assignment
Popović and Popović, Chapter 20
Connor and Salon, Unit IX

Problem 1 - **Lossy media parameters**
Find α, β, λ and η of an electromagnetic wave traveling through seawater (ε_r = 72, σ = 4 S/m) at 10 MHz and 100 GHz.

Problem 2 - **Energy & Power** - **lossy media**
A 10 MHz wave that is polarized in the x direction propagates in the +z direction in seawater. At z=0, it has a power density of 10 W/m^2 (Use the results of Problem 1).
a.   Write the electric and magnetic fields in phasor form.
b.   Write the electric field in time domain form.
c.   At what value of z will the power density of the wave be 1% of its initial power?