ECSE 2100 – Fields and Waves I
Fall 2008
Homework #1

1. For the following wave expressions, indicate if the wave is standing or traveling. If the wave is traveling, find the direction of propagation and the velocity.

  a) $\sin(500t + 0.3x)$

  b) $\cos(1.5 \times 10^5 t - 6 \times 10^{-1} z)$

  c) $\cos(120t)\sin(50x)$

2. Find the phasor representation of the following expressions

  a) $v(t) = 4\cos\left(\omega t - \dfrac{2\pi}{3}\right)$

  b) $v(t) = 2.5\sin\left(\omega t + \dfrac{\pi}{3}\right)$

  c) $v(t) = 8\sin\left(\omega t + \dfrac{2\pi}{3}\right) + 8\cos\left(\omega t - \dfrac{\pi}{3}\right)$

3. Find the time domain expression for the following phasors.
  a) $\tilde{V} = 3.5 + j1.5V$

  b) $\tilde{V} = 2.0e^{j\frac{\pi}{4}}V$

4. A wave is described by $v(t,z) = 3.5e^{-\alpha z}\sin\left(2\pi \times 10^8 t - 12\pi z\right)V$. Find the frequency, wavelength and velocity. At z = 2m the magnitude is measured as 1V. Find the attenuation constant.