Quiz 3, Monday, September 25, 2006
ECE 598 AL
The Speech Chain

Problem 1 (3 points)

Find the real-valued time domain signal implied by each of the following phasors.

(a)

$$\mathbf{x} = 6e^{-j\pi/4}$$

(b)

$$\mathbf{x} = -5j$$

(c)

$$\mathbf{p} = 2 + 6j \text{ Pa}$$

Problem 2 (4 points)

Find the phasor representation of each of the following time-domain waveforms.

(a)

$$x(t) = 6\cos(100\pi t - \pi/3)$$

(b)

$$x(t) = \cos(100\pi(t + 0.001))$$

(c)

$$x(t) = 6\sin(100\pi t - \pi/3)$$

(d)

$$x(t) = 2\sin(100\pi t - \pi/3) + 5\cos(100\pi t + \pi/3)$$

Problem 3 (3 points)

(a) Suppose that you are given the following relationship between force, $f(t)$ in Newtons, and velocity $v(t)$ in meters/second. If $v(t) = \mathbf{v}e^{j\omega t}$, what is $f(t)$?

$$f(t) = 2\frac{dv}{dt}$$

(b) Suppose that part (a) is the equation of motion for a large cast-iron frying pan being acted upon by force $f(t)$. What is the mass of the frying pan, in kilograms?