ME 460/660, Fall 1994, Exam 2

1) Find the steady-state response of the following system to a force $F(t)$=10sin(10t). The mass moment of inertia of the rod is $(ml^2)/12$ where m=10 kg. and l=1 m. The stiffness k=10N/m and the damping c=2 kg/s. Neglect gravity.

2) Use the convolution integral to find the response of an underdamped SDOF system to an impulse with $\hat{F} = 1$ at time zero and $\hat{F} = \exp(2\pi\zeta/\sqrt{1-\zeta^2})$ at $t = 2\pi/\omega_d$. Use k=100, m=1, and ζ=.05.

3) Find the Fourier transform of the following function: