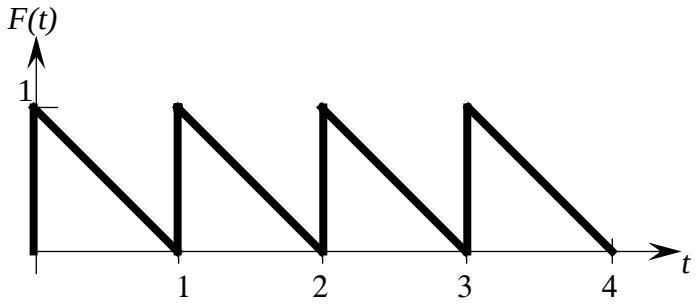
ME 460/660 Exam 2, Spring ‘96

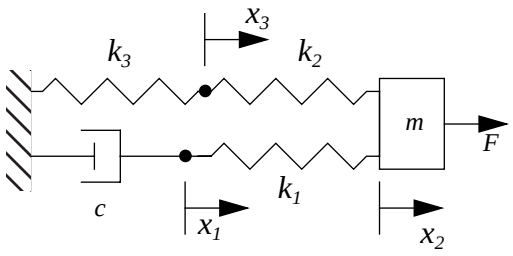
One equation sheet. Front and back. No examples. No derivations. It must be turned in with the exam.

1) Find the Fourier series representation of the following function. Write the series in the simplest form AND write the first few non-zero terms. (25 points)



2) A 50 kg motor is attached to a 50 kg table. The specifications for the motor are such that $m_0e <$ .001 kg•m. Choose/modify *m*, *c*, and *k* such that the maximum displacement of the table is less than .02 mm for motor speeds between 0 and 3000 rpm. (25 points)

3) Derive the equations of motion (do **not** solve) for the following system: (25 points)



4) Estimate *m*, *c*, and *k* from the plots below. All units are standard SI units (kg, m, s). (25 points)