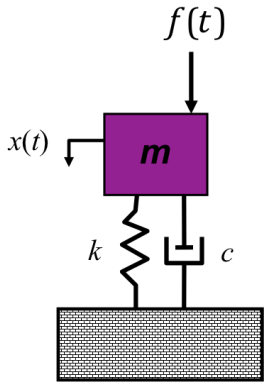
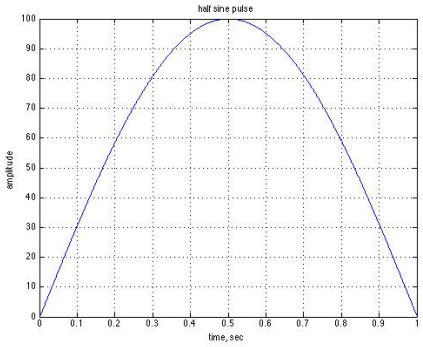
Take home assignment #1

Due Feb 24 – Turn in at beginning of class





The system shown is subject to a half-sine pulse input and all initial conditions = 0. Determine the time domain response for 5 seconds (0 < t < 5) using the following methods:

1. Compute numerically using the Euler form on slide #16. Use time steps of 0.01 sec.
2. Compare your answer to a harmonic excitation solution using $f(t) = 100\sin \pi t$ as the input at t = 0. Then subtract out a time-delayed and negative harmonic input starting at t = 1 sec to provide the response beyond 1 sec.
3. Compare the maximum amplitude response with the shock response spectrum on slide 40.
4. Turn in plots of your results and enough information so I can understand your analytical process (and of course show your code). Remember to type up in Word or some other processor – no hand-written assignments accepted.

Use the following parameters:

$$W = 100 lb$$
$$k = 7 lb/in$$
$$\zeta = 0.1$$