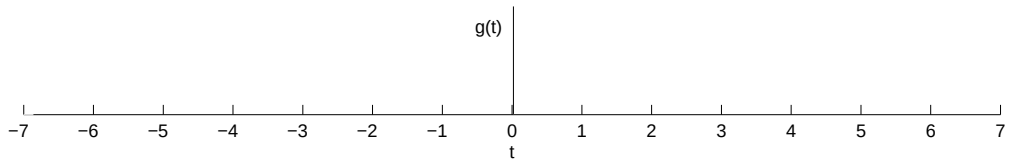
ENSC-380, Spring 2009
Review Problems

1. (Midterm,2008)

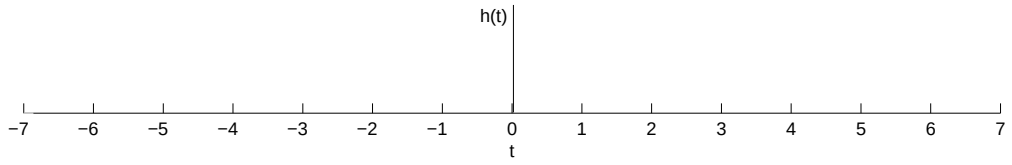
   - **a)** Sketch the following signal:

     $$g(t) = \text{comb}(t).\text{rect}(\frac{t-1}{3})$$

     Use the space below for your intermediate work but show your final answer on the provided axes. Clearly indicate the values on both axes.



   - **b)** Now sketch $h(t) = g(t/3)$



2. (Midterm 2008) A CT-LTI system is defined with the following differential equation:

$$y'(t) + 2y(t) = x(t) + 2x'(t)$$

Find the impulse response of this system, $h(t)$.

3. (Midterm 2008) Use the properties of CTFS and the FS formula given below ()

$$\cos(2\pi f_0 t) \overset{FS}{\longleftrightarrow} \frac{1}{2}\{\delta[k-1]+\delta[k+1]\} \quad \textbf{Representation Period: } T_0 = \frac{1}{f_0}$$

to find the CTFS representation(Harmonic function) of

$$x(t) = \cos(200\pi t + \pi/4)$$

with **representation period of** $T_f = 1/50$.

Notes: 1) Do not use any other entries from the FS table. 2) Try to simplify your result as much as possible.

4. Text, Problem 4-25 part (b)

5. Text, Problem 4-29

6. Prove the "Time Reversal" property of CTFS.