

# 2704: Signals and Systems

## Homework #3

Due: February 8, 2006

1. a. Determine the convolution of two unit triangle functions. b. What is the duration? Does it match theory?

2. Determine  $x_3(t) = x_1(t) * x_2(t)$  where

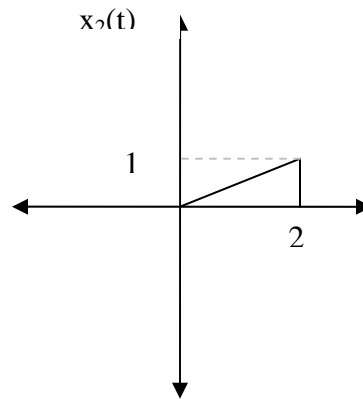
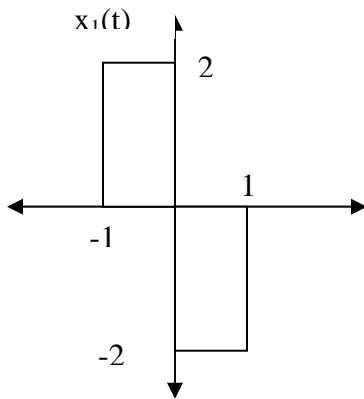
$$x_1(t) = \text{sinc}(tT)$$

$$x_2(t) = \delta(t-100T)$$

3. Determine the convolution of  $x_1(t) = \text{rect}\left(\frac{t}{T}\right)$  with  $x_2(t) = \exp(-Bt)u(t)$ .

4. Determine the convolution of  $x_1(t) = 2\text{rect}\left(\frac{t-5}{2}\right)$  with  $x_2(t) = \text{rect}\left(\frac{t+2}{4}\right)$ .

5. Determine the convolution of  $x_1(t)$  with  $x_2(t)$  where



6. Determine the convolution of a unit ramp with  $x_2(t) = \exp(-Bt)u(t)$ .