

# Signals and Systems ECE 202

## Assignment 1

1. If  $g(t) = 7e^{-2t-3}$ , write out and evaluate or simplify each function.
  - (a)  $g(3)$
  - (b)  $g(2 - t)$
2. Given that  $f(t) = \text{rect}(t + 2) + \text{rect}(t - 2)$ , plot the following functions:
  - (a)  $f(t)$
  - (b)  $g(t) = f(t - 1)$
  - (c)  $h(t) = f(t)u(t)$
  - (d)  $p(t) = h(t - 1)$
3. Plot the following:
  - (a)  $f(t) = \text{rect}(\frac{t}{4}) - \text{rect}(\frac{t}{2})$
  - (b)  $g(t) = 2\text{tri}(\frac{t}{2}) - \text{tri}(t)$
  - (c)  $h(t) = 2\text{tri}(\frac{t}{2}) - 2\text{tri}(t)$
  - (d)  $p(t) = [\text{rect}(\frac{t}{4}) - \text{tri}(\frac{t}{2})] \text{sign}(t)$
4. Given the positive real constants  $b$  and  $t_0$ , and the function  $f(t) = \text{tri}(t)u(t)$ , sketch the following
  - (a)  $f(t)$
  - (b)  $f(\frac{t}{b})$
  - (c)  $f(t + t_0)$
  - (d)  $f(-t)$
  - (e)  $f(\frac{t-t_0}{b})$
  - (f)  $f(\frac{t_0-t}{b})$
5. Find the even and odd parts of these functions
  - (a)  $g(t) = 2t^2 - 3t + 6$
  - (b)  $g(t) = \frac{2t^2-3t+6}{1+t}$
  - (c)  $g(t) = t(2 - t)(1 + 4t)$
6. Describe a signal (other than those given in class or the textbook). Use the internet to find some background information or examples of your signal. Prepare powerpoint slides to document your findings.