

EE322 Fall 2012 Homework Problem Set 6 (PS06)

1. Using MATLAB, write separate functions for the $u(t)$, $ramp(t)$, $rect(t)$ and $tri(t)$ functions. Call the m-files: $u.m$, $ramp.m$, $rect.m$ and $tri.m$. Provide a 2x2 subplot of what their output looks like if $t = -3:0.01:3$. Label your axes and each subplot. You might consider using the plot function's linewidth option to make the plotted lines more visible. Hint: the code for these functions are on page 33.
2. Write a MATLAB function for the *signum* function called sgn . Turn in your code for this function. Hint: you might use some of the code from step 1 to give you ideas how to do it.
3. Sketch a plot of $y(t) = u(t) - sgn(t)tri(t)$ by hand (this should be an accurate sketch). Then, using MATLAB and the functions above, plot $y(t)$. Be sure to use a small enough time step when you create the time vector so that the curves are smooth. Label your plot.
4. Sketch a plot of $z(t) = \text{sinc}^2(t)$ for $-3 \leq t \leq 3$ by hand (a rough sketch is fine). Download the $sinc322.m$ function from the course website under the [Homework](#) link. Using MATLAB and $sinc322$, plot $z(t)$. Be sure to use a small enough time step so that the curves are smooth. Label your plot. Note: this shape you will see over and over throughout EE.