

Exercise sheet 9 for Math 263: ODEs for Engineers Matt Roberts
16th March 2012

1. Write out the definition of $u_c(t)$.

2. Sketch

$$(1 - u_{2\pi}(t)) \cos t + u_{2\pi}(t)(t - (1 - 4\pi^2) \sin t).$$

3. What is the Laplace transform of

$$(1 - u_{2\pi}(t)) \cos t + u_{2\pi}(t)(t - (1 - 4\pi^2) \sin t)?$$

4. Solve

$$y'' + y = 4\pi\delta(t - 2\pi) + tu_{2\pi}(t), \quad y(0) = 2\pi, \quad y'(0) = 0.$$

If you spot any errors, please inform me: matthew.roberts@mcgill.ca