ECE 341 - Homework #7

Uniform and Exponential Distributions.

Uniform Distributions

Let

- a be a sample from A, a uniform distribution over the range of (0, 3)
- b be a sample from B, a uniform distribution over the range of (0,4)

1) Determine the pdf for a + b using moment generating funcitons (i.e. LaPlace transforms)

2) Determine the pdf for a + b using convolution (by hand or Matlab)

3) Assume each resistor has a tolerance of 5% (i.e. a uniform distribution over the range of (0.95, 1.05) of the nominal value. Determine the mean and standard deviation for the voltage at Y for the following circuit using a Monte Carlo simulation.
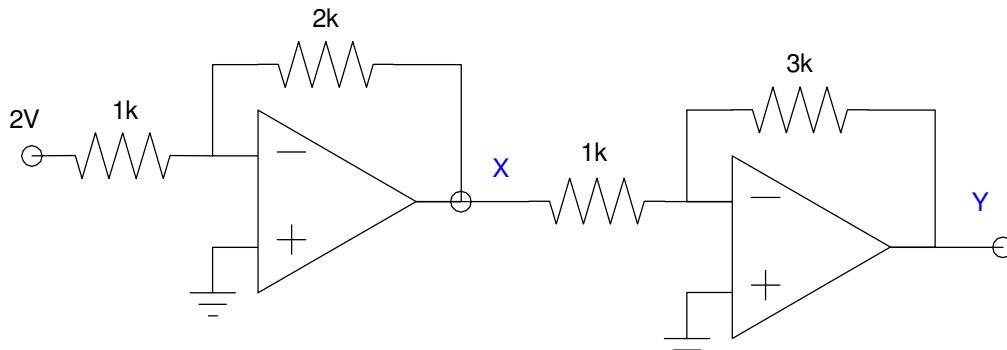
Exponential Distributions

Let

- d be a sample from D, an exponential distribution with a mean of 6
- e be a sample from E, an exponential distribution with a mean of 10
- f be a sample from F, an exponential distribution with a mean of 12

4) Let X = d + e

- a) Use convolution to find the pdf of X
- b) Use moment generating functions to find the pdf of X
- c) Check that the two answers match at t = 10 seconds.

5) Let Y = d + e + f

- a) Use convolution to find the pdf of Y
- b) Use moment generating functions to find he pdf of Y
- c) Check that the two answers match at t = 10 seconds.