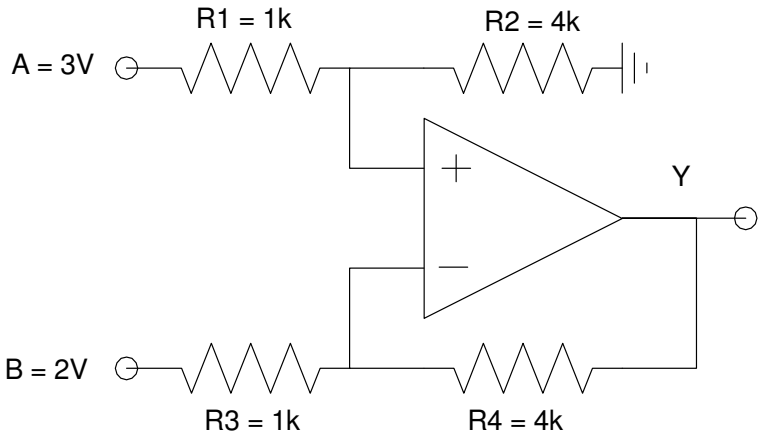
# ECE 341 - Homework #9

Weibull Distribution, Central Limit Theorem. Summer 2023

## Weibull Distribution

1) Determine and plot the cdf for the voltage, Y, in homework set #7 problem #3

2) Determine and plot the pdf for this voltage using a Weibull approximation for the cdf




Homework #7, problem #3. Find the pdf for the voltage at Y. All resistors are 5% tolerance

## Central Limit Theorem

The mean and standard deviation for a 4, 6, and 8-sided die are

| Die | d4 | d6 | d8 | d10 | d12 |
|---|---|---|---|---|---|
| mean | 2.5 | 3.5 | 4.5 | 5.5 | 6.5 |
| standard deviation | 1.1180 | 1.7078 | 2.2191 | 2.8723 | 3.4521 |
| variance | 1.2500 | 2.9166 | 5.2487 | 8.25 | 11.9167 |

5) Let Y be the sum of rolling four 10-sided dice (homework #4 problem 4):

Y = 4d10

a) What is the mean and standard deviation of Y?

b) Using a normal approximation, what is the 90% confidence interval for Y?

c) Using a normal approximation, what is the probability that the sum the dice will be more than 29.5?

d) Compare these results to the actual odds (from homework #4)

6) Let Y be the sum of rolling four 6-sided dice and two 8-sided dice (homework #4 problem 5):

Y = 4d6 + 2d8

a) What is the mean and standard deviation of Y?

b) Using a normal approximation, what is the 90% confidence interval for Y?

c) Using a normal approximation, what is the probability that the sum the dice will be more than 29.5?

d) Compare these results to the actual odds (from homework #4)

7) Let Y be the sum of rolling 2d4 + 3d6 + 4d8 (homework #4 problem 6)

Y = d4 +d6 + d8 + d10 + d12

a) What is the mean and standard deviation of Y?

b) Using a normal approximation, what is the 90% confidence interval for Y?

c) Using a normal approximation, what is the probability that the sum the dice will be more than 29.5?

d) Compare these results to the actual odds (from homework #4)