PHYS 160 - Homework #2

Make sure your name is listed as a comment at the beginning of your worksheet.

Research:

Lookup the Poisson distribution online. It should be a function of two variables (typically λ and k).

- Set $P(\lambda, k)$ equal to this distribution

- Plot: $P(5, k)$ over the interval $k = [0..10]$

Poisson Distributions:

The Poisson distribution represents the probability of independent events. Lets use it to estimate the number of homeworks assignments you may have any given week. Assume that each of your five teachers gives, on average, one assignment each week. The parameter λ represents the expected number of homeworks each week (in this case $\lambda = 5 * 1 = 5$). The probability that you'll have exactly 3 homework assignments this week then is:

$$P(\lambda = 5, k = 3) \approx 14\% \tag{1}$$

- What is the probability that you'll have exactly six homeworks?

- What is the probability that you'll have exactly zero homeworks? (sorry!)

- What is the probability that you'll have three or less homeworks?

Plot Animations:

To investigate the parameter λ make an animated plot:

- Plot $P(\lambda, k)$ over the interval $k = [0..20]$ and animated over $\lambda = [1..10]$

- As a comment - describe the effect λ has on the Poisson distribution.