applications of standard deviation, z-test, chi^2, Poisson , etc

1. I wish to give 2% of my class a grade of A+ on a midterm exam but I also want those students to get more than 95% on the midterm exam. My exam has an average score of 73%. What must the standard deviation on my exam be in order to meet my goals?

2. Stephanie, an expert sailor, is able to sail a specific course with an average time of 18 +/- 1 minute based on N=16 trials. BigMoo, a complete novice, sailed the same specific course, but due to sea sickness problems, was only able to complete N=4 trials. His average time was 23 +/- 4 minutes. Show whether or not Stephanie a statistically significantly better sailor than Big Moo?

3. On average, 3 dead Zardhogs appear every 2 miles of Texas highway. What is the probability that a Zardhog cleaning crew will have to process 4 dead Zardhogs in 1 mile of Texas Highway?

95% confidence means +/- 2-sigma; and you need to account for the slope error as well (3 +/- .5)

4. The Zinderland News (ZNN) has just released a story where Zindertists (a.k.a. Zinderland scientists) have reprogrammed the ZNA of Zinderbites so that Zindernoodles can grow faster. Since everyone in Zinderland understands regression, the ZNN story merely said: **Growth = (3.0 +/- 0.5) * Zbites + 2; σ =0.8**

Using Zbites = 20, calculate the 95% confidence levels on value of Growth using all of the known errors.

9. Describe some techniques that can be used to analyze noisy data.

Will give you at least one data set analyze in google sheets using the tools that you used in the assignments.

11. Explain how the D_{max} statistic is derived in the KS test and why the KS test is such a powerful statistical test when comparing one distribution with another.

16. In calculating the effects of habitat loss on a species, three critical variables are used: p, h and k. Explain what each of these are and how these variables are best obtained.