

Math 3D03
Assignment #5

DUE: TUESDAY, APRIL 1ST, 2014 IN CLASS (AT THE BEGINNING OF THE LECTURE PERIOD)

You can use statistical software to check your answers but you are required to show your calculations

1. If X_1, X_2, X_3 are independent and identically distributed exponential random variables with the same parameter $\lambda > 0$, compute the probability

$$\mathbb{P}\{\max(X_1 + X_2, X_3) \leq 2\}$$

2. Do problem 31.7 on page 1299 of the textbook
3. Do problem 31.14 on page 1299 of the textbook
4. Here is a random sample of 30 bolt diameters (in cm):

0.4964	0.4976	0.4991	0.5014	0.5008	0.4946
0.4994	0.5010	0.4997	0.4993	0.5013	0.5012
0.5017	0.4984	0.4967	0.5028	0.4975	0.5006
0.4972	0.5047	0.5069	0.4977	0.4961	0.4961
0.5021	0.4959	0.5015	0.5012	0.5056	0.4993

- (i) Compute the 95% confidence intervals for the mean μ and the variance σ^2 (assuming normality).
- (ii) Compute the χ^2 statistic, using appropriate intervals, to test whether the data is normally distributed with mean $\mu = 0.5$ cm and standard deviation $\sigma = 0.002$

5. Use the data in the following table to compute the regression line and also 90% confidence intervals for the regression coefficients a, b .

x	400	500	600	700	750
y	580	1030	1420	1880	2100

(x is the revolutions per minute and y is the horsepower of a diesel engine)

6. (*bonus question*) Consider the symmetry group of the regular tetrahedron.
 - (a) What is the order of this group?
 - (b) Determine all the conjugacy classes
 - (c) Compute the character table