

Name: \_\_\_\_\_  
Summer 2018

MAT 121  
Lab 4

**Problem 1:** In a certain Biology class, each of two exams are worth 15%, the final exam is 20% of the final course grade, the labs are worth 30% of the course grade, and the quizzes are worth 20% of the grade. If a student received a 86% and 76% on the exams, a 84% on the final exam, a 92% average on the labs, and a 95% quiz average, what is the students course grade?

**Problem 2:** Suppose  $A$  and  $B$  are *independent events* with probabilities  $P(A) = 0.3$  and  $P(B) = 0.7$ . Find  $P(A \text{ and } B)$  and  $P(A \text{ or } B)$ .

**Problem 3:** Waiting times for a certain type of building permit is normally distributed with mean 18 months and standard deviation 4 months.

(a) Find the probability that has person has to wait more than 17 months for this permit.

(b) Find the number of months that marks the top 40% of wait times.

**Problem 4:** The scores of the Math GRE exam follow a normal distribution. A sample of 20 scores is randomly selected and the sample mean and standard deviation are  $\bar{x} = 784$ ,  $s = 105$ . Use these sample results to construct the 98% confidence interval for the mean  $\sigma$  of all Math GRE test scores.

**Problem 5:** Suppose you wish to construct a 98% confidence interval for  $\mu$  with a sample size of 41. If it is known that  $\sigma = 10$  and the population appears to be very skewed, choose which one of the following critical values should be used:

(i)  $t_{\alpha/2} = 2.423$

(ii)  $z_{\alpha/2} = 2.33$

(iii)  $z_{\alpha/2} = 1.96$

(iv) neither