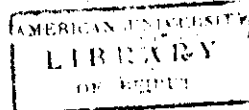




AMERICAN UNIVERSITY OF BEIRUT
MATH 207 FINAL EXAMINATION
Part I: Multiple choice

Aids allowed: One 8.5" × 11" formula sheet, calculator, Z, and t tables.

1. Erin is a runner who keeps accurate records of her training. In one season she averaged 3.4 miles per day with a standard deviation of .5 miles. What is her standard deviation in kilometers? (1 mile=1.6 kilometers)
 - (a) .50 kilometers
 - (b) .80 kilometers
 - (c) 1.60 kilometers
 - (d) 3.40 kilometers
 - (e) none of the above
2. In a population of students, the number of calculators owned is a random variable X with $P(X = 0) = .2$, $P(X = 1) = .6$, and $P(X = 2) = .2$. The mean of this probability distribution is
 - (a) 0
 - (b) 1
 - (c) 2
 - (d) .5
 - (e) the answer cannot be computed from the information given
3. Refer to previous problem. The standard deviation for this probability distribution is
 - (a) .40
 - (b) .63
 - (c) 1
 - (d) .36
 - (e) the answer cannot be computed from the above information



4. You want to compute a 90% confidence interval for the mean of a population with unknown standard deviation. The sample size is 30. The value of t^* you would use for this interval is
- (a) 1.96
 - (b) 1.645
 - (c) 1.699
 - (d) 1.697
 - (e) 1.311
5. A 95% confidence interval for the mean reading achievement score for a population of third grade students is (44.2, 54.2). The margin of error of this interval is
- (a) 10
 - (b) 5
 - (c) 2.5
 - (d) 95%
 - (e) The answer cannot be determined from the information given.
6. Refer to previous problem. The sample mean is
- (a) 44.2
 - (b) 54.2
 - (c) .95
 - (d) 49.2
 - (e) The answer cannot be determined from the above information.

7. A copy machine dealer has data on the number x of copy machines at each of 89 customers locations and the number y of service calls in a month at each location. Summary calculations give $\sum x = 747.60$, $\sum x^2 = 6667.92$, $\sum y = 1263.80$, $\sum y^2 = 19216.68$, and $\sum xy = 11219.85$. What is the slope of the least squares regression line of number of service calls on number of copiers?
- (a) .86
 - (b) 1.56
 - (c) 1.48
 - (d) none of these
 - (e) can't tell from the information given.
8. In the setting of the previous problem, about what percent of the variation in the number of service calls is explained by the linear relation between number of service calls and number of machines?
- (a) 86%
 - (b) 93%
 - (c) 74%
 - (d) none of these
 - (e) can't tell from the information given

Part II (please, show your work)

9. Assume that 10% of a population of electronic components are defective. A random sample of $n = 500$ is drawn from this population.
- (a) Give the mean and standard deviation for the proportion of defectives in the sample.
 - (b) What is an approximate value for the probability that the proportion of defectives is greater than .1?
 - (c) What is an approximate value for the probability that the number of defectives is less than 40?
10. A study is performed to investigate the relationship between college and high school grade point averages. A simple linear regression is used to predict the first year grade point average of college students using their high school grade point average. A sample of 100 students is used for the study. The equation of the least squares line fit to the data is $\hat{y} = 1.24 + .65x$.
- (a) Give an interpretation for the slope of the line under the above setting.
 - (b) If the standard error of the slope is .04, find the 95% confidence interval for the true slope of the line.
 - (c) Test the hypothesis that the slope is zero versus that it is positive. Give the test statistic, an approximate P-value, and state your conclusion.