While there are no specific course prerequisite requirements to be admitted to the Engineering Management Program, there is an expectation of a basic level of knowledge in quantitative topics typically found at the undergraduate level. Included are topics in statistics, engineering econ/finance and linear programming. Many courses do incorporate some refresher material, but material is covered quickly, in addition to the Master's level course content, so sometimes students find it a challenge to keep up.

The Engineering Management program is offering a "Quantitative Foundation for Engineering Managers" course to review these topics. (Please note that this course does not count towards the degree requirements.)

Do you need a refresher? Take the quiz below to help you evaluate your knowledge in the statistics area. You might want to download the formula sheet and Standard normal table to refer to when taking the quiz.

If you score less than 7 on this quiz, you should strongly consider taking the refresher course.

1. You are dealt a king from a standard deck of cards. What is the probability that the next card you are dealt will be a jack? (Both cards come from the same 52 card deck with 4 each of aces, kings, queens, jacks and the numbers 2-10.)
   a. 4/52
   b. 3/52
   c. 4/51
   d. 3/51

2. A bag of marbles contains 24 marbles: 5 red marbles, 6 white marbles, 8 yellow marbles and 5 green marbles. What is the probability of drawing a green marble and then a yellow one (without putting the green one back)?

   a. 5/24 + 8/24
   b. 5/24 + 8/23
   c. 5/24 x 8/24
   d. 5/24 x 8/23

3. A warehouse ships a package for an order. The probability that the order was correctly packaged is 85%. The probability that the package will be delivered on or before the specified delivery date is 67%. What is the probability that the patient receives a correct package within the specified delivery time?

   a. 57%
   b. 52%
   c. 67%
   d. 76%

4. The time to assemble a product follows a normal distribution with an average of 28 minutes and standard deviation of 2.0 minutes. The proportion of time that the assembly takes longer than 30 minutes to assemble is

   a. 0.8413
   b. 0.1587
   c. 0.2048
   d. 0.3271

5. Which of the following is <u>not</u> true of the binomial distribution?

   a. The outcome of each trial can only be success or failure
   b. The probability of a success is constant.
   c. The probability of drawing a club from a standard deck of cards can be determined with the binomial distribution
   d. Probabilities associated with successive flips of a coin can be analyzed with the binomial distribution.

6. Customer arrival rates follow a Poisson distribution. Customers arrive at a store at an average of 8 per hour. What is the probability that exactly 10 customers will arrive in an hour?

   a. 0.099
   b. 0.200
   c. 0.156
   d. 0.123

7. At a popular restaurant, during the dinner hours, the average time to wait for a table is 25 minutes. Assuming an exponential distribution what is the probability of being seated in less than 15 minutes after you arrive?

   a. 50.0%
   b. 45.1%
   c. 28.2%
   d. 57.3%

8. A sample of size 16 is taken from a process and the mean and standard deviation of the sample observations are calculated a 10.50 and 1.23 respectively. To determine the 95% confidence interval for the mean, which distribution should be used?

   a. Normal distribution
   b. t distribution
   c. F distribution
   d. Chi-squared distribution

9. Two machines are being considered for processing a critical component. Samples were taken from both machines:

	Sample size	Sample mean	Sample standard deviation
Machine A	21	0.99	0.34
Machine B	25	1.03	0.45

A hypothesis test will be used to test the hypothesis that the variance of Machine B is greater than the mean of A with 95% confidence.

The type of test which would be used to test the hypothesis is

a. 2 sample t test
b. 2 sample Z test
c. F test
d. Chi squared test for proportions

10. A simple linear regression was performed on a set of data and resulted in the equation y=-2x+30. The associated correlation coefficient, was determined to be r= -0.87. Which of the following is true of this analysis?

a. A calculation error has occurred as the correlation coefficient cannot be negative.
b. The r value is negative because as the x variable increases, the y variable also increases.
c. The relationship between variables x and y would be considered rather strong.
d. None of the above.