KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS & STATISTICS
STAT 319.05 Quiz #3

Name: _____ ID #: _____

1) Let c be a constant and consider the density function $f(x) = \begin{cases} c(2-x) & if\ 0 \le x \le 1 \\ 0 & otherwise \end{cases}$.

   a) Find the value of *c*.

   b) Find the cumulative distribution function.

2) The amount of time X in minutes that a train is late is a continuous random variable with probability density $f(x) = \begin{cases} \frac{3}{500}(25 - x^2) & if -5 \le x \le 5 \\ 0 & otherwise \end{cases}$.
Find the mean and variance of the amount of time the train is late.

3) The life of a semiconductor laser at a constant power is normally distributed with a mean of 7000 hours and a standard deviation of 600 hours.
   a) What is the probability that a laser fails before 6000 hours?

   b) What is the life in hours that 95% of the lasers exceed?

4) The time between calls is exponentially distributed with a mean of 5 minutes.
   a) What is the probability that the time until the first call is less than 5 minutes?

   b) What is the probability that the time until the first call is between 5 and 15 minutes?

   c) Determine the length of interval of time such that the probability of at least one call in the interval is 0.9.

   d) If there has not been a call in 10 minutes, what is the probability that the time until the next call is less than 5 minutes?

   e) What is the probability that there are no calls in the interval from 10:00 am to 10:05 am?