Q1. Assume that z scores are normally distributed with a mean of 0 and a standard deviation of 1. If *P(0.2 < Z < a)* = 0.23131, find *a*.

Q2. The diameters of pencils produced by a certain machine are normally distributed with a mean of 0.32 inches and a standard deviation of 0.01 inches. What is the probability that the diameter of a randomly selected pencil will be less than 0.297 inches?

Q3. Let Z is a standard normal variable, find the the probability that Z lies between 0 and 3.01.

Q4. The time between customer arrivals at a furniture store has an approximate exponential distribution with mean of 9.5 minutes. If a customer just arrived, find the probability that the next customer will not arrive for at least 21 minutes.

Q5. Suppose the probability density function of the length of computer cables is f(x) = 0.5 from 10 to 12 millimeters. Determine the mean and standard deviation of the cable length.

Q6. Suppose a continuous uniform random variable can be used to describe the outcome of an experiment with outcomes ranging from 41 to 81. What is the probability that this experiment results in an outcome less than 56

Q9. The tread life of a particular brand of tire is a random variable best described by a normal distribution with a mean of 65,000 miles and a standard deviation of 1500 miles. What warranty should the company use if they want 95% of the tires to outlast the warranty?

Q10. The lengths of human pregnancies are normally distributed with a mean of 269 days and a standard deviation of 16 days. What is the probability that a pregnancy lasts at least 302 days?

Q11. Let *X* represent the amount of time it takes a student to park in the library parking lot at the university. If we know that the distribution of parking times can be modeled using an exponential distribution with a mean of 4 minutes, find the probability that it will take a randomly selected student between 2.5 and 10 minutes to park in the library lot.

Q12. The time (in years) until the first critical-part failure for a certain car is exponentially distributed with a mean of 3.5 years. Find the probability that the time until the first critical-part failure is 6 years or more.

Q13. Assume that z scores are normally distributed with a mean of 0 and a standard deviation of 1. If *P(Z > c)* = 0.1093, find *c*.

Q14. Assume that the number of asbestos particles in a squared meter of dust on a surface follows a Poisson distribution with a mean of 1000. If a squared meter of dust is analyzed, what is the probability that 950 particles are found?

Q15. Transportation officials tell us that 70% of drivers wear seat belts while driving. Find the probability that more than 579 drivers in a sample of 800 drivers wear seat belts.