**MAT1372 Review #3**

**The test will cover sections 6.2, 6.3, 6.4, 6.5, 6.7, 7.3, 7.4.1, ~~7.6, 8.2~~, 9.2, 9.3**

**Continuous random variables: P. 265 #3, 4, 6**

1. Let X be a random variable such that its probability density function has the following graph

1

2

1. Show that this is a valid probability density function.
2. Use probability density function to find the probability P[1<X<2]
3. Suppose that the probability that a dart will land on the circular board with radius 10 inches has a uniform distribution and suppose the probability that the dart will land outside of the board is zero. If the inner circle has radius of 4 inches. What is the probability that the dart will hit the inner circle?

**Normal Distribution: P. 282 # 3, 5, 9 P. 289 # 4, 5, 10**

1. Scores on the MAT1372 exams are assumed to be normally distributed with the range [52, 84] which corresponds to data from 2 standard deviations below the mean to 2 standard deviations above the mean.
2. Find the mean and the standard deviation for this distribution.
3. Suppose students in the top 15% receive an “A”, what is the minimum score a student must receive to earn an “A”?

**Central Limit Theorem: P. 311 # 13, 14, 16 a, b,**

1. The delivery times for all food orders at a fast-food restaurant during the lunch hour have a mean of 6.7 minutes and a standard deviation of 2.1 minutes. Let  be the mean delivery time for a random sample of 49 orders at this restaurant.
   1. Find the mean and standard deviation of .
   2. What is the probability that the mean delivery time for 49 orders is less than 7 minutes?

**Hypothesis Testing P. 402 # 11, 12, 13**

1. A psychologist claims that the mean age at which children start walking is 12.5 months. A student wants to check if this claim is true. She took a random sample of 18 children and found that the mean age at which these children started walking was 12.9 months with a standard deviation of 0.8 months. It is known that the ages at which all children start walking are approximately normally distributed. Should the student reject the claim that children start walking at 12.5 months?
   1. State the null hypothesis and alternative hypothesis.
   2. Use 1% level of significance.
   3. Use 5% level of significance.