Math 1313   Section 7.6

Section 7.6: Applications

Example 1: According to the data released by the Chamber of Commerce of a certain city, the weekly wages of factory workers are normally distributed with a mean of $400 and a standard deviation of $50. Find the probability that a factory worker selected at random from this city makes a weekly wage of

a. more than $460?

b. between $350 and $450?

Theorem
Suppose we are given a binomial distribution associated with a binomial experiment involving n trials, each with probability of success p and probability of failure q. Then if n is large and p is not close to 0 or 1, the binomial distribution may be approximated by a normal distribution with $\mu = np$ and $\sigma = \sqrt{npq}$.

Example 2: Consider the following binomial experiment. A marksman's chance of hitting a target with each of his shots is 60%. If he fires 30 shots, what is the probability of his hitting the target between 15 and 20 times, inclusive?

Math 1313   Section 7.6

Example 3: Use the normal distribution to approximate the binomial distribution. A basketball player has a 75% chance of making a free throw. They will take 120 attempts. What is the probability of them making:

a.   more than 100 free throws?

b.   Fewer than 85 free throws?

Example 4: Use the normal distribution to approximate the binomial distribution. A die is rolled 84 times. What is the probability that the number 4 occurs more than 13 times?