**HW 5 – NORMAL DISTRIBUTIONS WITH TECHNOLOGY Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

*For all questions, assume that the distribution is normal. For each problem, draw the normal curve, label the horizontal axis, and shade the appropriate area.* ***Show all calculator steps!***

1. A survey found that mean length of time that Americans keep their cars has a mean of 5.3 years with a standard deviation of 1.2 years. If a person decides to purchase a new car, find the probability that he or she has owned the old car for:

a) less than 2.5 years b) between 2 and 5 years c) more than 9 years

d) The length of time John keeps his car is in the 90th percentile. Find how long John keeps his car.

2. The scores on an Algebra II test have a mean of 76.4 and a standard deviation of 11.4. Find the probability that a student will score:

a) above 78 b) below 60 c) between 80 and 85

d) Mr. Reeves scales his tests so that only 5% of students can receive an A. What is the minimum score Andrea can make on this test and still get an A?

3. The average life of automobile tires has a mean of 30,000 miles with a standard deviation of 2000 miles. If a tire is selected and tested, find the probability that it will have a lifetime:

a) between 25,000 and 28,000 miles b) between 27,000 and 32,000 miles c) over 35,000 miles

d) The tire company will replace tires whose tread life falls in the lowest 15% of all tires of this model. What is the lifetime of a tire that qualifies for replacement?

4. The mean height of an American man is normally distributed with a mean of 69” and a standard deviation of 2.4”. If a man is selected at random, find the probability that he will be

a) between 68” and 71” tall b) shorter than 67” c) taller than 72”

d) If Jose is in the 75th percentile, how tall is he? e) If a man is in top 17.5%, how tall is he?

5. A line up for tickets to a local concert had an average (mean) waiting time of 20 minutes with a standard deviation of 4 minutes. The times are normally distributed.

a) What percentage of the people in line waited for more than 28 minutes?

b) If 2000 ticket buyers were in line, how many of them would expect to wait for less than 16 minutes?

6. In an Oreo factory, the mean mass of a cookie is given as 40 g. For quality control, the standard deviation is 2 g.

a) If 10,000 cookies were produced, how many cookies are within 2 g of the mean?

b) Cookies are rejected if they weigh more than 44 g or less than 36 g. How many cookies would you expect to be rejected in a sample of 10,000 cookies?