STAT 301  Statistics I  Fall 2014

Quiz 7: Normal distributions

Taken on Mon Oct 6. You may work with a group of as many as 3 students, submitting one quiz with all names, provided that you all contribute to the work. You may use your text/notes.

Suppose that a tire manufacturer believes that the lifetimes of its tires follow a normal distribution with mean 50,000 miles and standard deviation 5,000 miles.

1. How many standard deviations above the mean is a tire that lasts for 58,000 miles?

2. Determine the probability that a randomly selected tire lasts for less than 58,000 miles. (Use the normal probability table.)

3. Determine the mileage such that 75% of all tires last for longer than this mileage. (Use the normal probability table.)

4. Suppose that the manufacturer wants to issue a money-back guarantee for its tires that fail to achieve a certain number of miles. If they want 90% of the tires to last for longer than the guaranteed number of miles, how many miles should they guarantee? Show/explain how you arrive at your answer.

5. Suppose that the manufacturer wants to adjust the standard deviation of the production process (without changing the mean) so that 99% of its tires last for more than 40,000 miles. Would the manufacturer need to achieve a smaller standard deviation, or could they accomplish this goal with a larger standard deviation? Explain/justify your answer.