STAT 312 – Quiz 14
Normal Distributions

Taken on Tues Oct 27. You may work with a group of as many as 4 students, submitting one quiz with all names, provided that you all contribute to the work. You may use your notes.

Suppose that a tire manufacturer believes that the lifetimes of its tires follow a normal distribution with mean 48,000 miles and standard deviation 5,000 miles.

1. Determine the $z$-score corresponding to 40,000 miles.

2. Determine the proportion of tires that last for more than 40,000 miles.

3. If the manufacturer wants to issue a guarantee so that 99% of its tires last for longer than the guaranteed lifetime, what $z$-score should it use to determine that guaranteed lifetime?

4. If the manufacturer wants to issue a guarantee so that 99% of its tires last for longer than the guaranteed lifetime, how many miles should it advertise as its guaranteed lifetime?

5. Suppose that the manufacturer wants to adjust the standard deviation of the production process (without changing the mean) in order that 99% of its tires last for more 40,000 miles. What value for the standard deviation should they aim for?