STAT 345 - Handout 4

Normal Distribution Examples

Based on section: 4.6

1. Paleomagnetic studies of Canadian volcanic rock known as the Carmacks Group were performed and revealed that the northward displacement of the rock units has an approximately normal distribution with standard deviation of 500 kilometers. One group of researchers estimated the mean displacement at 1,500 km, while a second group estimated the mean at 1,200 km.

   (a) Assuming the mean is 1,500 km, what is the probability of a northward displacement of less than 500 km? [0.022750]

   (b) Assuming the mean is 1,200 km, what is the probability of a northward displacement of less than 500 km? [0.080757]

   (c) If, in fact, the northward displacement is less than 500 km, which is the more plausible mean, 1,200 or 1,500 km?

2. A standard fluorescent tube has a life length that is normally distributed with a mean of 7,000 hours and a standard deviation of 1,000 hours. A competitor has developed a compact fluorescent lighting system that will fit into incandescent sockets. It claims that the new compact tube has a normally distributed life length with a mean of 7,500 hours and a standard deviation of 1,200 hours.

   (a) Which fluorescent tube is more likely to have a life greater than 9,000 hours? [0.022750, 0.105650]

   (b) Which tube is more likely to have a life less than 5,000 hours? [0.022750, 0.018763]