

1. Multiple sclerosis is a serious neurological disease. The following data set gives the age of onset of multiple sclerosis for 32 individuals.

23 52 32 27 28 30 13 37
33 29 25 31 26 30 5 29
41 27 30 34 28 19 31 29
32 28 33 28 31 29 28 30

Use hypothesis testing with $\alpha = 0.05$ to determine whether it is plausible that the mean age of onset in the population is 30 years. You may need to use a t-score table and a calculator.

2. True or False:
- (a) The p-value is the probability that the null hypothesis is true.
 - (b) The p-value for a 2-tailed test is typically double that of the corresponding 1-tailed test.
 - (c) For very large data sets, the t-distribution is very close to normal.
 - (d) When we fail to reject the null hypothesis, that means that the null hypothesis is most likely true.
 - (e) When we reject the null hypothesis, that means the null hypothesis is false.
3. In a data set with 16 entries, what is the probability the sample mean differs from the population mean by more than half a sample standard deviation?
4. After an exam, 8 students are discovered to have had their notes under their desks, where it would be easy to look at them. A small investigation is launched after the exam finishes to determine whether they were cheating. The exam of 200 students had a mean score of 28 points, with a standard deviation of 12. These 8 students received between them an average score of 40. Given $\alpha = 0.05$, do you find it plausible they didn't cheat?

5. Articulate in your own words the difference between when we might use a z-score and when we might use a t-score.