MATH 130: STUDY GUIDE FOR QUIZ 3

Things to Know

- **Concepts.** Be able to explain the difference between qualitative and quantitative data. Know which statistical measures only work for quantitative data. Know the meaning of averages and standard deviation. Know what a normal distribution is. Know what z-scores mean. Be able to explain the meaning of different parts of hypothesis testing: null hypothesis, p-value, etc.
- **Calculations.** Know how to calculate different kinds of averages: mean, median mode. Know how to calculate standard deviation. Know how to calculate z-score. Know how to convert a z-score to a percentile, given a table of values.

Note Sheet and calculator

For the quiz you are allowed a single sheet of paper (standard 8.5 by 11 size, front and back) for notes to reference during the quiz. Here's some suggestions for what to put on your note sheet.

- Any definitions you don't feel you have confidently memorized.
- The formulas for different calculations: mean, standard deviation, z-score.
- A reminder that you've got this and will ace the quiz.

You also are allowed a calculator for the quiz. It is written so that a calculator is not necessary for any problem, but if you want one you can bring one. I cannot allow phones, laptops, and other electronic devices which function as more than just a calculator.

Sample calculational questions

See the unit 3 worksheets for examples of the sorts of questions to expect. Here are a few more.

(1) Find the mean, median, and mode of the following data set:

$$-3, -2, 1, 0, 0, 3, 5.$$

(2) Explain why the following data set doesn't have a unique mode:

$$-4, -4, -1, 2, 2, 6, 6.$$

(3) Find the mean and standard deviation of the following data set:

$$-2, 5, 10.$$

(4) Without doing any calculations, which of the following data sets has the larger standard deviation? Explain your choice.

$$0, 10, 20 \qquad \text{or} \qquad 0, 100, 200$$

(5) In a statistics class the mean score on the final exam was 75 and the standard deviation was 10. Determine the z-scores of the following exam grades:

$$x_1 = 100, \qquad x_2 = 80, \qquad x_3 = 65, \qquad x_4 = 55$$

(6) Assume that the exam scores are normally distributed. Use the following table to determine the percentiles of the four exam grades from the previous problem.

z-score	percentile
-3	0.1th
-2.5	0.6th
-2	2.3th
-1.5	6.7th
-1	15.9th
-0.5	30.9th
0.0	50.0th
0.5	69.1th
1.0	84.1th
1.5	93.3th
2.0	97.7th
2.5	99.4th
3.0	99.9th