Math 207
Introduction to Statistics

Exam I

No books, notes or calculators are allowed on this exam.

1. (Hypothetical) In a clinical trial, data collection usually starts at "baseline," when the subjects are recruited into the trial but before they are randomized to treatment or control. Data collection continues until the end of the followup. Two clinical trials on prevention of heart attacks report baseline data on weight, shown below. In one of these trial, the randomization did not work. Which one and why? (15 points)

		Number of persons	Average weight	sd
(i)	Treatment	1,012	185 lb	28 lb
	Control	800	173 lb	26 lb
(ii)	Treatment	1,006	202 lb	26 lb
	Control	1,002	162 lb	25 lb

2. In a health study, subjects' heights has an average of 64 inches and sd of 3 inches. Make a rough sketch of the histogram of subjects' heights. About what percent of the subjects were taller than 70 inches? (10 points)

(20 points)

3. a) Find the mean, median and sd of the list 141, 150, 148, 150, 150, 157, 154.

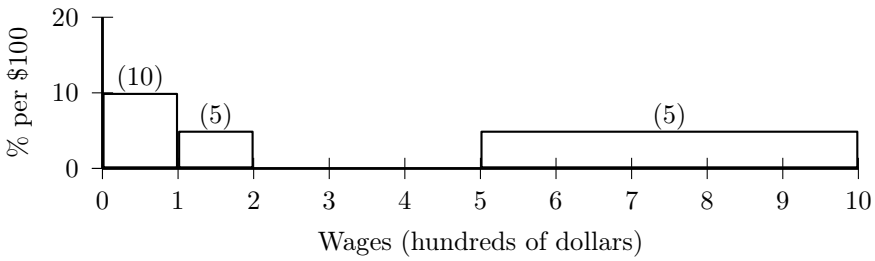
b) Which numbers in the list are within 1 SD of the mean?

(15 points)

4. a) The Governor of California proposes to give all state employess a flat raise of $1,000 per year. What would this do to the average annual salary of state employees? What would this do to the SD?

b) What would a 2.5% increase in the salaries, across the board, do to the average annual salary and to the SD?

5. A histogram of monthly wages for part-time employees is shown below (densities are marked in parentheses). Nobody earned more than $1,000 per month. (20 points)



a) The block over the class interval from $200 to $500 is missing. Determine how tall it must be then add it to the histogram.

b) About what percent of the employees earned between $700 and $900 per month?

c) About what percent of the employees earned more than $200 per month?

6. The table below shows results from two experiments designed to test the Salk vaccine in 1954. (20 points)

Randomized controlled double-blind experiment		
	Size	Rate*
Treatment	200,000	28
Control	200,000	71
No consent	350,000	46

NFIP study		
	Size	Rate*
Grade 2 (vaccine)	225,000	25
Grades 1 and 3 (control)	725,000	54
Grade 2 (no consent)	125,000	44

*Rate is number of cases per 100,000 subjects.

a) Describe the treatment and control groups and how they were selected in the two experiments.

b) What does *consent* mean in the context of the experiments?

c) Which rates demonstrate the vaccine's effectiveness in the two experiments (there are two rates to compare for each experiment)?

d) Which experiment gave stronger evidence for the vaccine's effectiveness and why?

e) What impact did the different sizes of the six groups have on your conclusions and why?