



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? (10 points)

		Number of persons	Average weight	sd
(i)	Treatment	1,012	185 lb	25 lb
	Control	997	143 lb	26 lb
(ii)	Treatment	800	166 lb	27 lb
	Control	1,002	162 lb	25 lb

2. In 2005, men averaged about 540 on the Math SAT. The sd was about 120. Make a rough sketch of the histogram of SAT scores. About what percent of the scores were under 660? Assume a normal distribution. (15 points)

(20 points)

3. a) Find the mean, median and sd of the list 41, 48, 50, 50, 50, 54, 57.

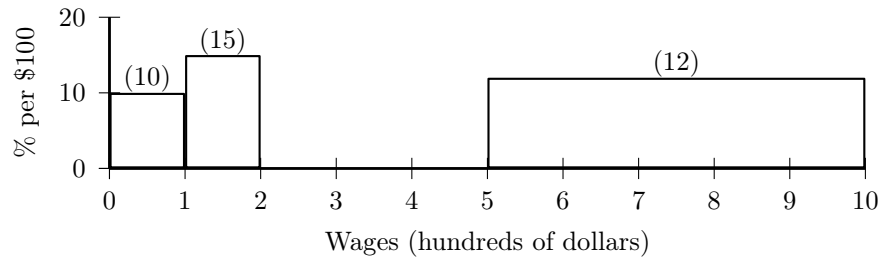
b) Which number in the list are within 0.5 sds of the mean?

(15 points)

4. a) The Governor of California proposes to give all state employees a flat raise of \$250 per month. What would this do to the average monthly salary of state employees? What would this do to the sd?

b) What would a 5% increase in the salaries, across the board, do to the average monthly 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 \$600 and \$800 per month?

c) About what percent of the employees earned less than \$500 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			NFIP study		
	Size	Rate*		Size	Rate*
Treatment	200,000	28	Grade 2 (vaccine)	225,000	25
Control	200,000	71	Grades 1 and 3 (control)	725,000	54
No consent	350,000	46	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?