Note: The exam has 5 questions, for a total of 110 points. Explain your answer and write down necessary details of your calculation. No txplanation/ details = N o credits. Good Luck!

1. The following data set contains the number (in dollars) a sample of 11 people spent in one year on books.
$\begin{array}{lllllllllll}156 & 150 & 109 & 98 & 136 & 170 & 178 & 195 & 110 & 1900 & 133\end{array}$
(a) (10 points) Display the data using a stem-and-leaf plot (with a suitable bandwidth).
(b) (10 points) Find the mean of the data set.
(c) (10 points) Do you think mean or median better represent the "center" of the data? Explain briefly.
2. (10 points) Give a example of lurking variable. Explain and comment how it complicates the assessment of causal relation.
3. (a) (10 points) The distribution of heights of young men is approximately normal with mean 70 inches and standard deviation 2.5 nches. Sketch a normal curve on which this mean and standard deviation are correctly located. (Hint: Draw the curve first, locate the points where the curvature changes, then mark the horizontal axis; Extra Hint: Fig 13.8 in Text).
(b) (30 points) (Continued) Use 68-95-99.7 rule or Table B (Text, P547) to answer the following questions.

- What percentage of men are taller than 75 inches?
- Between what heights do the middle $95 \%$ of men fall?
- What percent of men are shorter than 67.5 inches?

4. (10 points) The report of a sample survey of 1500 adults says, "With $95 \%$ confidence, between $27 \%$ and $33 \%$ of all American adults believe that drugs are the most serious problem facing our nation's public schools.". Explain to someone who knows no statistics what the phrase " $95 \%$ confidence" means in this report.
5. Although opinion polls have long found that about 40\% of A merican adults say they attended religious services last week, this is almost certain not true.
(a) (10 points) What might we expect answers to a poll to overstate true church attendance?
(b) (10 points) You suspect strongly that the true percent attending church in any given week is less than $40 \%$. You plan to watch a random sample of adults and see whether or not they go to church. What are your null and alternative hypotheses? (Be sure to say in words what the population proportion pis for your study)
ps. Some of the problems are taken directly from Exercises of the Textbook, Statistics: Concepts and controversies. 5th Edition.
