

NAME _____

24 September 2008

MATH 156.3 — TEST I*PLEASE READ THESE INSTRUCTIONS:*

Problems have varying point values, which are specified next to each problem number. Move quickly through the test, but try to be as accurate as you can. Do as many problems as you like; points over 100 will count as extra credit.

If you want credit for an answer, *you **must** explain what you are doing – this means defining your terms and explaining **each step** in your work.*

You may use a graphing/statistical calculator. You may not use your book or notes or a formula card.

PLEASE TURN OFF YOUR CELL PHONE.

[Please do not write in the boxes below:]

1a :	/12
1b :	/4
1c :	/8
1d :	/6
1e :	/2
1f :	/6
2a :	/12
2b :	/12
2c :	/12
3a :	/6
3b :	/8
3c :	/8
3d :	/6
3e :	/6
4a :	/4
4b :	/4
4c :	/4
4d :	/4
4e :	/6
4f :	/10
Σ :	

[38]

1

Researchers compared achievement scores of 348 Chicago third-graders, based on whether or not the child had a television in his/her bedroom and whether or not there was a computer in the home. They found that those children with a TV in their bedrooms scored substantially lower on the mathematics portion of the test than those without a TV. Also, those with a computer in their homes scored substantially higher on the language arts portion of the test than those without a computer.

- [12] **(a)** Identify two explanatory and two response variables. Classify each as categorical (possibly binary) or quantitative.

- [4] **(b)** Is this an observational study? Explain.

- [8] **(c)** Can you conclude that a bedroom TV is harmful to a child's academic development and that a home computer is helpful to a child's academic development? Explain.

- [6] **(d)** Suggest a potentially confounding variable in this study, and explain why it is confounding.

- [2] **(e)** Identify the sample in this study.

[6] **(f)** To what population would you feel comfortable generalizing the results of this study? Why?

[36] **2** Here is some data – it is the lengths, in miles, of 40 day hikes in San Luis Obispo County, California:

0.6	1.0	8.5	4.0	2.5	2.0	3.8	4.6	1.5	1.0
2.5	4.0	3.5	2.6	1.8	2.0	2.5	3.2	1.5	1.0
4.6	6.0	5.5	4.0	3.4	5.0	3.0	4.5	7.0	6.0
3.4	3.7	5.8	2.2	1.5	2.0	9.5	2.6	7.4	6.0

[12] **(a)** Create a stemplot of this distribution.

[12] **(b)** Create a histogram of this distribution.

[12] **(c)** Describe this distribution – make sure you comment (at least) on its **shape**, **center**, and **spread**.

- [34] **3** Suppose you want to investigate whether students who sit close to the instructor tend to do better on statistics midterms than those who sit farther away.
- [6] **(a)** Identify the observational units, explanatory variable and response variable.
- [8] **(b)** Describe how you could perform an *observational study* to address this research question.
- [8] **(c)** Describe how you could perform an *experiment* to address this research question.
- [6] **(d)** Identify an advantage of the observational approach. Explain.
- [6] **(e)** Identify an advantage of the experimental approach. Explain.

- [32] **4** Suppose I am interested in the average number of Activities per Topic in our Workshop Statistics textbook, but I am too lazy to count them all. So perhaps I decide I will choose a Simple Random Sample of five Topics and see the average for this sample.
- [4] **(a)** What are the observational units in this question?

[4] **(b)** What is the population?

[4] **(c)** What is the parameter I am interested in?

[4] **(d)** What is the statistic I will actually compute?

[6] **(e)** What is a “Simple Random Sample”, in general?

- [10] **(f)** The Topics are numbered 1 through 29. Explicitly find an SRS of size 5 from among all these Topics [so: tell me the five Topic numbers you will include in your sample, describing exactly how you chose those numbers]; use, if you like, the following line from a Table of Random Digits:

1 7 1 3 9 2 7 8 3 8 1 9 1 3 9 8 2 0 3 1 4 6 1 4 3