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I. Departmental Information for all sections of MATH 1342 (also see http://www2.austin.cc.tx.us/math/)

**Required Texts:** *The Basic Practice of Statistics*, 2nd edition, by David S. Moore


**Optional:** *Study Guide for The Basic Practice of Statistics* by Fligner, Notz, and Busam

**Syllabus:**

- Chapters 1 - 4, 6 - 9, and 11 with the starred sections optional (at the instructor’s discretion). Some time at the end of the semester is scheduled for other optional material.

  - In this course, students will learn to
  - 1. Determine the aspects of a question, if any, for which statistics can provide relevant information.
  - 2. Analyze statistical studies, particularly regarding appropriate sampling and experimental design.
  - 3. Select and use appropriate statistical analyses to get useful information from data.
  - 4. Communicate knowledge using standard statistical language and also interpret it in non-technical language.

**Required Technology:**

1. Calculator with statistical functions. If you are buying a calculator, be sure to get one that does both one-variable and two-variable statistical functions. (The cost is under $20.) If you already have a calculator and don’t know whether it is adequate, ask your instructor.

2. Access to Minitab computer software. **You are not expected to buy this.** It is available in the computer labs. Your instructor will give you a handout about using Minitab at your campus. (For information about the availability of Minitab at other campuses, check this Website: http://www2.austin.cc.tx.us/mparker/1342/ti/) If, after you have become familiar with the software in the lab, you want to buy a copy, please contact look at the website for information.

**Prerequisite.** You will be expected to:

1. understand material from the text after reading it.
2. do homework using fairly complicated formulas after seeing one example
3. do some, but not much, algebraic manipulation of formulas

In general, this will require that you remember a reasonable amount of high school algebra and have reading ability at the 12th grade level or higher.

**Attendance.** You are expected to attend every class day for the entire class period. In a math class, it is impossible for the teacher to give you permission to miss any material. The most efficient way to cover the material is to come to class every day, and to do the homework soon after that. If you miss many classes (or two in a row) it will be very difficult for you to catch up.
Time Required. In college-credit courses, you are expected to spend two to three hours outside of class for every hour in class. In the summer, that means about four or five hours per class day – with some of that time in the computer lab and testing center. It WILL NOT work to spend just a few minutes every day and a lot of time on the weekend. You must spend a significant amount of time during the week. Take time now to plan your schedule.

Videotapes
The videotape series "Against All Odds" is available in the LRS at the large campuses for viewing there. It was developed by the author of our text and has 26 half-hour videotapes. You will find these tapes very useful if you miss a class or need more discussion of a particular topic. However, note that they are intended as a supplement to the class. They are not a replacement for class attendance. They are also shown on ACC’s cable channel (Channel 19 in most systems, Channel 61 on Williamson County system) on Mondays from 1:30-4:00 p.m. Five 30-minute lessons are shown each week. A listing of the viewing schedule and how it is tied to our text is given elsewhere in this handout.

Testing Scheme
Because of the nature of the material, each test is comprehensive on all the material up to that point. At least 3/4 of each test (except Test 5) will be problems from the material since the previous test.

Test 1: through Chapter 1
Test 2: through Chapter 3
Test 3: through Chapter 6
Test 4: through Chapter 8, sec l
Test 5: through the end of the course

Withdrawals
Attendance is required in this course. Students who miss more than 3 classes may be withdrawn. After the withdrawal date each semester, neither the student nor the instructor may initiate a withdrawal. It is the student's responsibility to initiate all withdrawals in this course. The instructor may withdraw students for excessive absences (4) or failure to meet course objectives but makes no commitment to do this for the student.

Incompletes
Incomplete grades (I) will be given only in very rare circumstances. Generally, to receive a grade of I, a student must have taken all examinations, be passing, and have a personal tragedy occur after the last date to withdraw which prevents course completion.

Keep track of your work and grades:
1. When anything is assigned, write it on the calendar on the next page.
2. When you receive graded material back, write the grade on the calendar on the next page in the margin or here. Keep all graded material in a folder at home.
3. Write your homework grades here:    ____  |  ____  |  ____ | ____ | ____
4. Write your test grades here:    ____  |  ____  |  ____ | ____ | ____
### Calendar:

<table>
<thead>
<tr>
<th>Date</th>
<th>Assignment</th>
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<tbody>
<tr>
<td>Wed June 7</td>
<td>Turn in info sheet Cover 1.1, 1.2</td>
<td>Tue June 27</td>
<td>Turn in ____ and ____ Cover 6.3</td>
</tr>
<tr>
<td>Thur June 8</td>
<td>Turn in Proj. A. and ____ Cover 1.3</td>
<td>Wed June 28</td>
<td>Turn in Proj. G and ____ Cover 6.4, 7.1</td>
</tr>
<tr>
<td>Mon June 12</td>
<td>Turn in ____ and ____ Cover 2.1, 2.2 Take Test 1 in TC</td>
<td>Thur June 29</td>
<td>Turn in ____ and ____ and hw for Test 3 Cover 7.1 Test 3 in class (one hour)</td>
</tr>
<tr>
<td>Tue June 13</td>
<td>Turn in Proj. B and ____ Deadline for Test 1</td>
<td>Mon July 3</td>
<td>Turn in Proj. H and ____ Cover 7.2</td>
</tr>
<tr>
<td>Wed June 14</td>
<td>Turn in ___, __ &amp; hw for Test 1 Cover 2.4, 2.5</td>
<td>Tue July 4</td>
<td>NO CLASS</td>
</tr>
<tr>
<td>Thur June 15</td>
<td>Turn in Proj. C and ____ Cover 3.1</td>
<td>Wed July 5</td>
<td>Turn in ____ Cover 8.1</td>
</tr>
<tr>
<td>Mon June 19</td>
<td>Turn in Proj. D and ____ Cover 3.2</td>
<td>Thur July 6</td>
<td>Turn in Proj. I and ____ Cover 8.2 Take Test 4 in TC</td>
</tr>
<tr>
<td>Tue June 20</td>
<td>Turn in ____ and think about Proj. E Cover 4.1, 4.2 Take Test 2 in TC</td>
<td>Mon July 10</td>
<td>Turn in Proj. J Cover 9 Test 4 deadline</td>
</tr>
<tr>
<td>Wed June 21</td>
<td>Turn in Proj E Cover 4.3, 4.4 Test 2 deadline</td>
<td>Tue July 11</td>
<td>Turn in ____ and ____ and hw for Test 4 Cover 11</td>
</tr>
<tr>
<td>Thur June 22</td>
<td>Turn in ___, ____ and hw for Test 2 Cover 6.1</td>
<td>Wed July 12</td>
<td>Turn in ____ and ____ Cover 11 and Review</td>
</tr>
<tr>
<td>Mon June 26</td>
<td>Turn in Proj. F and ____ Cover 6.2</td>
<td>Thur July 13</td>
<td>Turn in ____ and ____ and hw for Final Exam</td>
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<td>Final Exam in class</td>
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</table>
II. Information about Mary Parker's sections

**Instructor.** Dr. Mary Parker, 223-4846, NRG 2147, mparker@austin.cc.tx.us  
<http://www2.austin.cc.tx.us/mparker/>, fax number 478-6814  
Office Hours: MTWH 11 a.m. -- 12:15 p.m.  
I am also available for appointments at other times.

**Grades.** Your six grades will be averaged: five tests (possibly one replaced by your homework grade) and one daily work grade.  
A: 90-100; B: 80-89; C: 70-79; D: 60-69; F: below 60  
If you believe that I have made a mistake on grading anything, write a note of explanation on a separate sheet of paper, staple it to the paper, and turn it in for re-grading. I am happy to discuss this with you outside of class, but grades will never be changed or corrected “on the spot”. Such corrections must be made very soon after the paper was originally graded. **No grades will be corrected except through this procedure.**

**Tests.** Tests 1, 2, and 4 will be in the Testing Center at NRG and Tests 3 and 5 will be in class. (You will need your ACC student ID and a picture ID, like your driver’s license, to use the Testing Center.) You are expected to take some notes **in your own handwriting** into each test, and those **must** be turned in with the test. (If you violate the rules about the notes, I will take off what I consider to be an appropriate number of points from that test grade.) For test 1, you may take one page, front and back. For the other tests you may take two pages, front and back. Tests must be done entirely on your own, with no help from anyone else. Violating the rules of the testing center, or giving or receiving help on tests is scholastic dishonesty, and the punishments are severe. There are reviews for the tests available on my website. Students who are unable to access that may ask me during my office hours or after class for me to print them a copy.

For Tests 1--4, a student who misses a test or who makes below 60 on a test may come to me for additional make-up work. This may include taking another test. When that work is satisfactorily completed, the test grade will be raised to a 60. **Test grades of above 60 can only be earned by taking the regular test on time.** Such make-up work can be done on no more than two tests.

Deadlines for the tests will be enforced very strictly. Occasionally students have a good reason to miss a test. That's why there is a liberal provision for making up one test grade.

**Homework.** All of the homework problems for the course are listed in this handout. You are responsible for doing the problems over the material covered in class each day by the next class, checking your solutions in the text or Student Study Guide, and asking your questions during the next class or office hours. Each of the five homework sets is due the class day after the test deadline. It will be graded on a scale of 0 – 20 and the five grades are combined for one homework grade of 0 – 100. That grade may be substituted for your lowest test grade on Tests 1 – 4, if the test grade is at least a 60 and if the homework grade is higher than the test grade. The homework grade may not be substituted for the final test grade, nor may it be substituted for the quiz grade.

**Daily Quizzes and Projects.** These are used to measure your attendance as well as you are keeping up with the material in the course. Students occasionally miss class for good reasons but it is important to keep up with the new material. Thus, these **quizzes may not be turned in late for any reason.** Instead of accepting late quizzes, I provide a substantial amount of extra credit work. I do that by assigning daily quizzes and projects every day during the semester, averaging 6 points per day. At least 120 points of quizzes and projects will be assigned, but no more than 100 points will be counted.

Because I have found that telling people what the quiz problem is when they ask me outside of class seems to encourage them to miss class, I will not do that. It is OK for you to learn what it is from your friend in class. (Now is a good time for you to make an acquaintance in the class and possibly it will turn into a friendship!) If you turn in a quiz on any day when you don't attend the full class, you must write a
note on the quiz explaining how much of the class you missed. Then I can deduct the one point for attendance, but give you credit for the work. If you turn in a quiz on a day when you don't attend class for the full period, and don't write such a note on it, that is scholastic dishonesty.

**Supplemental Material:** There is quite a bit of supplemental material available from my website, including activities and test reviews. [www2.austin.cc.tx.us/mparker/1342/](http://www2.austin.cc.tx.us/mparker/1342/)

**Class Rules:**
1. In accordance with school policy, you may not bring food or drink into class.
2. Please turn off or mute volume on beepers and cellular phones so as not to disrupt class.
3. Arrive for class a few minutes early so that you can have your materials out and be ready to start class on time.
4. Disruptive behavior (talking to others while I am lecturing, rudeness, etc.) will not be tolerated.
5. Class discussion will focus on the material being presented and will be about matters relevant to the entire class. Discussion of your individual situation belongs in office hours or, occasionally, in the part of the class time that I have identified as devoted to working individually with students.
6. Children are not allowed to attend class with you.
7. Remember you are here to learn; be prepared to participate in class discussion. We are all unique individuals and in this class everyone's opinion will be respected whether we agree or disagree.
8. Counseling services are available to help you with a variety of needs, if you would like more information please ask.
9. Office hours are before class, but I am also available for a short time after class. Ask immediately if you need help! I am here to help you learn. In the summer, getting behind even one day will cause you to be confused and frustrated. Getting behind more than one day is likely to cause you to fail. Don't let that happen!!
10. Quiz problems will never be accepted late. A moderate amount of extra credit is available to everyone.
11. Tests may not be taken late. Some flexibility in the time to take several of the tests is already allowed in the testing scheme. Provisions are made for dropping a test grade too, so that one missed test will not hurt your grade.
12. All students must take the final exam at the scheduled time. There are no exceptions.
13. If you enroll in the class late, you are subject to the same rules as students who enrolled in the class before the class began. The standard grading scheme allows enough flexibility for all students to make up a reasonable number of absences.
14. Cheating will not be tolerated.
15. Remember that July 6, 2000 is the last day to withdraw from (or be reinstated in) this class.

**Computer work:** I know it is inconvenient for many students to find the time to go to the lab and do this work, but it is important. Being well-educated in statistics at the current time includes being able to use some statistical software and for this course to transfer to the local universities, we must include a computer component. Thus, you will have to use the computer to do a substantial amount of the required work. Be sure that you are familiar with the software before the third day of class (Monday). Do the orientation assignment no later than the first weekend and then start on the computer homework and projects.
Homework, Math 1342

When you read a statistics problem that requires a calculation, one of the first things you must do is determine whether you will do the calculation by hand, use a calculator, or use the computer software. In this course, you are required to do a number of the problems using the computer software, to make sure that you develop enough skill with the software as well as with hand calculations. Your instructor will discuss this more with you during class. During the test, of course, you will not have access to the computer software. Any test questions regarding the computer component of the course will either be about how to interpret the computer output or about the various options you must choose from to use the correct procedure in the computer software. There will not be any questions about the format of the commands or the make-up of the menu windows.

In the suggested homework, a problem with a C beside it means that you are expected to use a statistical calculator in some part of it and a problem with an M beside it means that you are expected to use the MINITAB computer software in some part of it. Most of the problems with M are also given in the MINITAB Guide and the statement of the problem there includes specific information on how to do it. In addition, I have extensive notes on the computer problems in this handout. USE THEM! On these problems, as on all homework, you should spend as much time and thought answering questions about what the results mean as you spend calculating. Your answers should reflect this.

You probably don’t want to go to the computer lab every day, so you may decide to put off the computer problems and only go to the lab twice a week or so. That is acceptable. Of course, if you have easy access to the computer software, you should do the computer problems as they come up in the homework.

Sometimes students decide they don’t have time to do the computer homework and just don’t get around to it, particularly in Chapters 1 and 2, when we are learning how to use the software. Then, at the end of the semester when they are already rushed, they find that they must go back and do the computer homework pretty much from the beginning or else get a very bad grade on the last couple of tests and homework. Don’t put yourself in that situation!

Chapter 1:
Sec. 1: 1, 3, 7, 8, 9, 10(M), 18, 19, 23, 26(M)
Sec. 2: 27(C), 28, 29, 31, 35(C), 39, 41(M), 45(M), 47, 49
Sec. 3: 50, 51, 53, 55, 56, 57, 58, 59, 60, 61, 63, 67, 69, 71
Review: 75(M), 81, 83, 85, 86(M), 88, 89

Chapter 2:
Sec. 1: 1, 3, 4&5 (M), 7, 9, 11(M), 13, 15(C or M)
Sec. 2: 17ac(C or M), 18, 19, 20(C or M), 21(M), 26, 27 29
Sec. 3: 31, 33(M), 35(M), 36, 37(C or M) (you'll need to draw at least one line by hand), 39, 41, 45(M), 47, 49
Sec. 4: 53(C or M), 55, 57, 59, 63, 65, 67
Sec. 5: 69, 71, 73, 75, 77, 79, 81, 83, 87
Review: 91, 93, 95, 96(M), 99(M), 101

Chapter 3:
Sec. 1: 1, 3, 5, 7(M), 11, 12, 13, 15, 17, 19, 23, 27, 28(M), 29
Sec. 2: 33, 34, 35, 39, 41, 47, 49, 55, 57
Review: 61, 65, 69, 71, 75
Chapter 4:
Sec. 1: 1, 3, 7(maybe only 10 trials), 9, 11(M), 13(M)
Sec. 2: 15, 19, 21, 22, 23, 29, 31, 33, 35, 37
Sec. 3: 39, 40(M), 41, 43, 45, 47(M), 49, 53, 55
Review: 59, 61, 63, 65
Sec. 4: 67, 72, 73, 75, 77

Chapter 5: (Optional) Problems will be assigned if it is covered at the end of the semester.

Chapter 6:
Sec. 1: 1, 3, 5(by hand and computer), 9, 13, 15, 17, 19(M), 21, 23
Sec. 2: 25, 27, 29, 31, 33, 35(M), 39, 41, 45, 46, 49, 53
Sec. 3: 55, 57, 59, 60, 61
Sec. 4: 63 (Additional problems may be assigned.)
Review: 75, 77(M), 79, 81, 83

Chapter 7:
Sec. 1: 1, 3, 5, 7, 9(M), 11, 13, 15, 17, 21, 25
Sec. 2: 28, 29, 31, 33(M), 35(M), 37, 39, 41, 43(M), 49
Review: 59, 61, 67

Chapter 8:
Sec. 1: 1, 3, 5, 7, 9(M), 11(M), 13, 19, 21(M), 22
Sec. 2: 27, 33, 39, 41(M)
Review: 43, 45, 49(M)

Chapter 9:
1, 3, 5, 7(also write hypotheses), 13(M), 15, 19, 21(M), 23(M)

Chapter 10: (Optional) Problems will be assigned if it is covered at the end of the semester.

Chapter 11:
Sec. 1: 5, 6, 7(M)
Sec. 2: 9
Sec. 3: 11
Review: 13, 14, 15, 16, 17, 21(M), 25(M)

Chapter 12: (Optional) Problems will be assigned if it is covered at the end of the semester.
III. Homework Guidelines

A. How to do it

Your success in this course is largely determined by how well you do your homework. It is important that you spend enough time doing it (at least 2 hours outside of class for every hour in class, and more if you miss class), and that you do it in an appropriate manner.

1. **Do it on time** --- before the next class. Of course, it is much easier to do the homework after I answer questions on it in class. However, the object of doing homework is not to get correct solutions down on a piece of paper, but to learn something. If you avoid the stage of formulating your own questions and just listen to others’ questions, you will have avoided about half the opportunity to learn. Your test grades will reflect that.

2. If you look back at an example to see how to do a problem, be sure **you understand the reasons for each step**. If you don’t, write a question and leave space to write the answer when you find it.

3. If you cannot work a problem, **write a question in a complete sentence** about what you don’t understand. Make it as specific as possible so that when you learn the answer to that question, you will be able to make progress on the problem. Leave room to write the answer to that question when you find it.

4. **Show enough work** (and draw enough pictures) that two weeks later you can remember what you did to solve the problem.

5. Keep your homework clearly labeled and **organized in a notebook**. When it is time to turn the homework in, take just the current part out of the notebook and put it in a separate thin folder. Make sure it is in order, beginning to end, and each problem is clearly labeled. When it is returned to you, put it back in your notebook. You will need homework from the earlier chapters later in the semester.

6. On the test you will not have several problems of one type all together. You will have to rely on the instructions and the statement of the problem for guidance in how to proceed. **Practice reading the problem carefully on every homework problem!**

7. There are a few students who will spend too much time reading the book and doing the homework. Often this is because they do not understand the value of writing out questions about the material, and instead they feel that they must understand every single point in the section before the next class. Of course, when something confuses you, you should make sure you understand any previous work that is being used. After you have done that, and then if you have spent 10 minutes trying to understand some specific point without success, you should spend several minutes writing as specific a question as you can about what your question is. Then leave that particular topic until you have an opportunity to check with your instructor or a classmate and get your question answered. **Learning to formulate good questions and get them answered is actually more important to your future success than learning the statistical techniques.**

8. For computer assignments, the main part I will grade is **your interpretation of the computer output**, in terms of the question asked. Your interpretations must be on the same page as your output. Either write them on the output or cut the appropriate pieces from the output and tape them onto the page where you are writing your interpretations. Make your solution as clear and well-organized as you would if you were giving it to your supervisor at work.
**B. How to get the maximum grade.**

If you are one of the students who learns easily without doing a lot of practice problems, you may choose not to try to get a good homework grade. In the grading scheme, it is only used to “make up” for a low test grade. I do recommend that you turn in the homework for the first couple of chapters, just to get off to a good start and to make sure that you don’t throw away the “make up” opportunity too early.

1. Done on time, turned in on time, with all the computer work and review problems done and at least 80% of the rest.

2. Organized in a thin folder, with the assigned problems (from this part of the course only) in order (from beginning to end). The MINITAB homework for this part of the course can be mixed in with the others or in a separate section, in order, from beginning to end.

3. Don’t copy it directly out of the solution manual.

4. Cover page, with a list of ALL ASSIGNED problems and a symbol or comment beside each one.
   - Complete and correct the first time, before checking. (Check)
   - Needed help to get it done correctly (H, for Help)
   - There was something about it that I never was able to figure out, even with help, although I did most of it. (Check, with a question mark)
   - Didn’t have a clue! (Just a question mark)
   - Didn’t do it. I read it and it was obvious how to do it and I didn’t need the practice. (E, for “Not done, too easy”)
   - Didn’t do it because I just ran out of time. (X)

9. **Grading homework – comments:**
   - I never accept (for credit) homework “in installments.” Be sure to turn in all your problems the first time. Also, homework that is completed after the deadline for the test is not acceptable for credit.
   - I’m looking for evidence that you worked the problem, rather than just copying the answer or copying the solution from the solution manual.
   - I usually check all the computer problems and review problems individually and “spot-check” others. **To earn an A or B on homework, you must have all the computer problems and review problems done, and at least 80% of the others.** How strict I am about completion of all the others depends on how well you demonstrate that you have learned the material.
IV. Projects

Many of these require computer work. Some require more thought than typical quizzes. Each will be assigned one day to be turned in the following day. You are encouraged to use this page to get a head start on working them and asking questions about them.

**Project A** (3 pts): (Can be done after Chapter 1, section 1)

Example: I might want to measure the lengths of cats. The cases (also called individuals) are cats, and the variable is “length”, in inches, measured to the nearest inch. Some questions which occur are (1) Should I include the tail? and (2) If I include the tail, do I measure to the tip of the fur or just to the tip of the tail without the fur? Other variables which might be interesting are “weight” and their “eye color”.

**Observations** on the length of a cat might be 15 inches, 18 inches, 12 inches, and 13 inches.

Now, you do one. Think of some variables which you might be interested in analyzing sometime.

1. What is the question you’re interested in investigating?
2. Describe what a single case is.
3. Describe three different variables that could be measured on a case.
4. Pick one of the three variables (underline it) and describe how you would measure it and what the units will be. Are there likely to be any problems or ambiguous situations?
5. For that variable, give four observations that would be reasonable to see.

**Project B:** (2 pts) Special questions about analyzing the data in Chapter 7, problems 74, 75, and 76. (Can be done anytime after Chapter 2, section 1.)

1. Make an appropriate graph to illustrate the distribution of city pollution levels. Describe the distribution: shape, center, and variation.
2. Make an appropriate graph to illustrate how, for each day, the city pollution level and the rural pollution level compare. Summarize this in words and numerical estimates. (There is more than one good way to do this. There are also incorrect ways to do this. Choose a graphing procedure that answers the question.)

**Project C:** (4 pts) More special questions about analyzing the data in Chapter 7, problems 74, 75, and 76 (Can be done anytime after Chapter 2, section 3.)

1. Make a scatterplot and find the regression line to predict city pollution from rural pollution. Interpret each of the coefficients in words.
2. Make a residual plot of the residuals versus the $x$-variable and interpret it.
3. Use the "fit" subcommand or menu choice to get the computer to predict the city pollution on a day when the rural pollution is 78. Cut out and hand in the appropriate part of the computer printout.
4. Write a sentence describing how well one can predict city pollution on a day from rural pollution on that same day. Include a reference to any useful statistics.

**Project D:** (3 pts) Chapter 2, problem 38. In addition to the questions in the problem, also look at the MINITAB output in the Session Window for information about influential points. This is a good problem to practice because you know that the dataset has at least one influential point, so you can see that in the output. What does MINITAB tell you about whether Child 19 is influential? What can you see about whether Child 19 is influential based on the calculations and graphs you're being asked to do in the problem? Does what you have observed agree with what MINITAB tells you about Child 19? Print the relevant part of the Session Window and include that output along with your discussion.

**Project E:** (6 pts) (Can be done anytime after Chapter 3, section 2) Plan a study.

1. Formulate the question. Think of a question of interest to you for which you (you, as a student and an individual) could collect some data.

Examples:
a. What percentage of cars don’t completely stop at the stop sign at the north corner of Waterston and Hartford?
b. In a blind taste test, do people prefer Classic Coke to Pepsi?
c. How accurately could we predict hat size from forearm length?

Write the question and explain how this question is of interest to you or someone. How might accurate knowledge about the answer change someone's actions?

2. Identify relevant variable(s).

Explain what the variable(s) is and how you expect to measure it. Discuss any definitions needed.
(Remember the example about the length of a cat -- does that include the tail or not?)

3. How would you collect useful data?
Is this a question for which you just go collect data or do you have to set up an experiment? (Example b above requires you to set up an experiment.) Explain how you could get a reasonable sample or set up a reasonable experiment. Describe the population in which you are interested and explain how this method of collecting data should get representative data from this population.

Project F: (3 pts) Chapter 2, problem 96. Similar to Chapter 2, problem 15, except now you must use the LET command on the computer to find the logarithms. This problem illustrates a common technique used in regression analysis, in which transformations of one or both variables are used in order to find a better straight-line relationship. We will not do very much of that in this class, but a second statistics course would do this in much more depth.

Project G: (6 pts) Chapter 2, problem 98. Do this as if it were a report to your supervisor at work, who needs to understand this data. Write about a one-page summary of the results for the problem, answering all the questions asked. Cut pieces from your computer output, label them appropriately, and put them into your report in appropriate places. Make sure that your narrative has appropriate explanations of the computer output shown. (3 points for the analysis, 3 points for the presentation)

Project H: (3 pts) Chapter 11, number 24. (Can be done anytime after Chapter 2, section 3) Answer all the questions in the problem except for the confidence interval part of c. For part c, just use the computer to make the prediction and cut out that part of the computer output to include in your answer. Include the part of the output that has the confidence interval, even though you haven’t yet learned to interpret it.

Project I: (3 pts) Chapter 11, number 25. (Can be done anytime after Chapter 2, section 3). Answer all the questions in the problem except for the confidence interval part of e. For part 3, just use the computer to make the prediction and cut out that part of the computer output to include in your answer. Include the part of the output that has the confidence interval, even though you haven’t learned to interpret it.

Project J: (6 pts) Chapter 7, problems 74, 75, and 76. Do this as if it were a report to your supervisor at work, who has been asked to provide a statistical analysis of the data for a client of your firm. Write a one- or two-paragraph summary of the results for each problem, mentioning your answers to all the questions asked in the problem, the techniques you used to answer the question, and how you checked to make sure the techniques were appropriate. Show some of your computer output as supporting material for your summaries. (3 points for the analysis, 3 points for the presentation)
AGAINST ALL ODDS: INSIDE STATISTICS
a videotape series on introductory (not calculus based) statistics
Shown on most area Cable Systems on the
ACC Channel (Channel 19 almost everywhere, Channel 61 on Williamson County Cable)

Viewing times for the current semester
Mondays 1:30-4:00 p.m.

Each half-hour program contains several documentary segments shot on location to illustrate varied applications of statistics, as well as explanations of the statistical ideas and examples of how to do the computations. The numbers after the titles below are the corresponding sections of David Moore’s textbook, Basic Practice of Statistics, 2nd ed., which is used in the mathematics department at ACC and in both the mathematics and business departments at the University of Texas at Austin.

1  What is Statistics?
2  Picturing Distributions  1.1
3  Numerical Description of Dist’ns  1.2
4  Normal Distributions 1.3
5  Normal Calculations 1.3
6  Time Series 1.1
7  Models for Growth  2.3
8  Describing Relationships 2.1
9  Correlation  2.2
10 Multidimensional Data Analysis
11 The Question of Causation 2.4
12 Experimental Design 3.2
13 Experiments and Samples 3.1

14 Sampling and Sampling Dist’ns 4.3
15 What is Probability?  4.2
16 Random Variables 4.2
17 Binomial Distributions 5.2
18 The Sample Mean and Control Charts 4.3, 4.4
19 Confidence Intervals  6.1
20 Significance Tests  6.2, 6.3
21 Inference for One Mean 7.1
22 Comparing Two Means  7.1, 7.2
23 Inference for Proportions 8.1, 8.2
24 Inference for Two-Way Tables Ch. 9
25 Inference for Relationships Ch. 11
26 Case Study Ch 6-12

The entire videotape series is available for viewing in the Media Centers of the Learning Resource Centers. The entire series will also be shown each semester on the ACC channel of local cable systems. Videotaping these programs for personal use does not violate copyright laws. It is expected that students and others will do so.

Calculator Hints for Chapter 1:
Use this set of numbers:  4, 5, 8, 9, 9
1. By hand, showing all work, find the mean.
2. By hand, showing all work, find the standard deviation.
3. Using your calculator, find the mean and the standard deviation. Make sure they’re the same as in 1 and 2.
4. Write down instructions for yourself about how you did these calculations on the calculator.

If you are having trouble getting started with your calculator, read through these questions and your manual and try to answer them. If you have trouble with any of them, see me before the next class.
* Does your calculator have a statistics mode? If so, how do you get into it?
* How do you enter one-variable data?
* After you have the data in, can you punch something and see how many data points you have entered?
* After you have the one-variable data in, what button(s) do you push to get the mean?
* What button(s) do you push to get the standard deviation? (Probably there are two -- one with n and one with n-1. For our purposes, we want the n-1.
* If your calculator has two-variable statistics, it will have different keys for the mean of x and the mean of y. Also, there is probably a different statistics mode for one-variable statistics and two-variable statistics. Sometimes the mode for one-variable statistics is called the “standard deviation” mode and for two-variable statistics, the “regression” mode.
Orientation Assignment for MINITAB for Windows (Revised December 9, 1999) (nothing to hand in)

Bring your MINITAB Guide with you to do this assignment. Before you start, you should look at the pollution dataset on page 426-427 of our textbook so you'll know what the data mean. If you spend a bit of time looking over the indicated pages of the MINITAB Guide before you come to the lab to do the assignment, you will spend less time in the lab.

This handout is in three parts: the tasks, some general comments, and the "answers". Read each task and use the MINITAB Guide as indicated to do it. Don't look at the "answers" until you have made a reasonable attempt to do it yourself. Most of what you are supposed to be learning here is how to use the MINITAB Guide to help you do the work.

When you do computer homework, never spend more than 5 or 10 minutes being "stuck". Write down a question and bring it to the next class.

Tasks:

1. Open an existing MINITAB worksheet (p. 7-8). The data is in a subfolder of "Data" named "data Moore 2nd edition". A more complete version of the datasets is available on some computers, called "data Greenberg 2nd edition". Open the file in Chapter 7 named ta07-08.MTP. Since this is a portable worksheet, you'll have to be sure to indicate that you want it to show you portable files. That is NOT the default setting.

2. Make a HISTOGRAM of one of the variables in the dataset (p. 15-16). Then make the Session window (where you type commands) active again by choosing the Session window under the "Window" menu close to the end of the list.

3. Use DESCRIBE (p. 26) to get lots of information about the data on one of the variables. Can you tell the meaning of some of these summary statistics? Which have you not studied yet? Print the contents of the Session window. Be sure to look at this session window each time and think about how to interpret what you see there.

4. Use PLOT (p. 45) to look at the relationship between two variables. We'll discuss methods for analyzing relationships that are fairly linear. Does this seem to be? If you know which variable you want to appear on the vertical axis, where do you put it in this command?

5. Use CORRELATE (p. 48-49) to obtain a numerical measure of the relationship between these two variables. When you learn about this in Chapter 2, section 2, you'll see why it is very convenient to have the computer find it rather than compute it yourself, even with a calculator.

6. Use LET (p. 31-32 and p. 51) to take the cube root of 'city' and then look at the relationship between this transformed variable and 'rural'. Does it look more or less linear or about the same?

7. Use SAMPLE (p. 69) to select a random sample of five of these 36 days and put the values of the three variables for those five days in columns c6, c7, and c8.

8. Make a graph like one of those you already did above and print it. (See below for help with printing.)

General Comments:

9. Something isn't right? Then restart. Find this in the "File" menu. This will erase what you have so far, so print or save what you want first.

10. Which window is active? Various windows include a Session window, a Data window, maybe a graph, etc. To see which is active, go to the menu item "Window" and see which one at the bottom is checked. Select a different one to be active if you wish. Or, without going to the menu, look to see which has the
darker title bar. To make a different window active, move the cursor into it and click. Then it will have the darker title bar.

11. **If there's not a command prompt . . . :** In the Session window, the last line should show MTB> If it doesn't, see the details in the answer section below.

12. **Print a graph.** Make the Graph window active, then go to the "File" menu and choose "Print Window".

13. **Print all your commands.** Make the Session window active, then go to the "File" menu and choose "Print Window".

14. **Print a selection of your commands.** In the Session window, select (highlight) the part you want to print (which will also make the Session window active) and then go to the "File" menu and choose "Print Window".

```
Answers:
```

1. "File" menu, "Open Worksheet", then find the data worksheet on your computer or CD. When you first call up the data directory, it will look empty. That's because the default setting in the program is just to look for .MTW files and all of these our text are .MTP files. To see them, you'll have to check the "Portable" option.

2. HIST c2

3. DESC c2
   For example, you recognize the "Median" and "StDev". You will not recognize "Tr Mean".

4. PLOT c3*c2
   Fairly linear.
   The first variable given appears on the vertical axis.

5. CORR c2 c3

6. LET c4=c3**(1/3)
   PLOT c4*c2
   Also fairly linear

7. SAMP 5 c1-c3 c6-c8 or SAMP 5 from c1-c3 into c6-c8

8. Make the Graph window active and then "File" and "Print Window". **Very important:** When you are doing your homework, you need to write your answers to the interpretation parts of the questions on the output before you have completed the problem. Since this wasn't really a question about the data, there is nothing to interpret. There will be interpretation parts on your homework questions.

9. "File" and "Restart" or "File" and "Exit" if you don't want to go back into MINITAB.

10. Just practice making various windows active. One of the frustrating things for people is trying to do something in a window that they didn't make active first. It won't work!

11. If you don't have a MTB> prompt in the Session window, then go to "Edit" menu, "Save Preferences", "Session Window", "Select" and then, in the dialog box, at the upper right, choose "Enable Command Language". Then choose "OK" and then "OK". That should make the MTB> prompt appear. (I have tried to get the lab technicians to install MINITAB with this enabled, but occasionally instructions get confused and they don't. But now you can fix it!)

12. For printing, please ask the lab technician if you can't get it to work. Sometimes there is a problem with the printer being out of paper or maybe some setting is wrong. If you are ever doing your homework and can't print for some reason, don't despair. Write down (briefly) the crucial results of the analysis that you see on the screen and make a note that there was a problem with printing, mentioning what lab, what day, and what time. Turn that in. Instructors are relatively lenient about this because we know that problems do arise from time to time.
Notes on some problems from the
Suggested Minitab homework, Math 1342

5/22/00
Please send corrections or suggestions to Mary Parker, mparker@austin.cc.tx.us

For a given computer homework problem, find in the MINITAB Guide. It's not there, then use the problem statement from the textbook. Then, if there is a note here, read it. After that, read the discussion of the appropriate command(s) from the chapters in the MINITAB Guide. The references to the data files in the MINITAB Guide are not completely consistent with the data files on the CD. One purpose of this handout is to help you find all the data files. But it also has other useful information.

Recall that the most important parts of the computer homework are your interpretations, shown by your handwritten analysis answers to the questions. "Undigested" computer printout will receive no credit. Make sure that your interpretations are complete and it is clear which part of the computer output you refer to.

Don't spend more than 5 minutes being "stuck" on any problem. Write down a question and ask your instructor in class the next day.

Chapter 1: 10, 26, 41, 45, 75, 86
1. In 10, the data for years is not entered in the data file in the same way as in the text. However, you don't need it, so ignore it. Part a should read, "Make a timeplot using TSPLOT of the interest paid . . ." (I think the time variable here is "days since 1900" or something similar to that. Divide by 365.25 and see what I mean. However, there's an extra 1/4 of a year. So it must be "days from Jan. 1, 1999 to April 1 of a year".)
2. In 26, note that the data from the text is in Table 1.6 on pages 26-27, so the data file is ta01-06.mtp.
3. In 75, recall that the DELETE command was described on page 9 of the MINITAB Guide. Also, it works to select (highlight) the entire row and use the Delete key.
4. In 86, if you're using the commands rather than the menus, note that this is the first homework problem using a subcommand. See page 24 for a discussion of the UNSTACK command and re-read page 19 about the syntax for subcommands. For example,
   MTB> UNSTACK c2 into c4 and c5;
   SUBC> SUBSCRIPTS in c1.

Chapter 2: 4, 5, 11, 15, 17, 20, 21, 33, 35, 37, 38, 53, 96, 98, 99
Overall: Be sure to look at the results in the Session window and learn to find the parts you need. Do not just rely on what is printed with the graph.
1. In 4 & 5, again the data for the year is in that strange form. Since it is not used, don't worry about that. Students often find that determining which is the response variable in problems involving two variables is difficult. Practice that at every opportunity. When plotting the data, the main question to ask yourself is which variable to list first. Read page 45 in the MINITAB Guide. Part c of the question in the MINITAB Guide should be done AFTER you have completed sections 3 and 4 of chapter 2. It is important to learn to use the PREDICT subcommand, which will be used again later in the course. (Check your prediction by plotting it on your graph and seeing whether it looks right.)
2. In 11, again, be sure to put the correct variable on the vertical axis. Parts b and c of the question in the MINITAB Guide should be done AFTER you have completed sections 3 and 4 of chapter 2. Notice how Minitab identifies an influential point. Look at this part of the output in the Session window for every regression computation.
3. In 15, no data file is provided, but it is very small and easy to type in yourself. This is a very important problem because it is one of the few opportunities you have to explore transformations of the data. Recall a similar problem about transformations of a variable in the Orientation handout, where you were asked to look at page 51-52 and at page 31 of the MINITAB Guide.

4. Numbers 17 & 20 can be done with a two-variable calculator. If you don't have one, or if you prefer to use the computer, use MINITAB to do these. The data sets are small enough to easily type in yourself.

5. The data file for number 21 is in the file labeled ex02-12.mtp. First answer part b from your understanding of correlation coefficient and then check your answer by converting the time to seconds (use the LET command and multiply the times by 60) and computing the correlation again. Is the result what you expected?

6. As you do problems 33, 35, 37, 45, 53, note the difference between the two menu options described in the middle of page 50 and right above the middle of page 51. The second draws the line. Note that no option here draws two lines, so in numbers 37 & 38, you'll have to draw at least one line by hand. Also notice that the output in the Session Window gives some information about influential points. This is important.

7. No data files have been provided to practice using the TABLE command, relevant to problems 68 - 88 in the text. Those files are missing from the collection of data files and may be provided later.

8. In 96, you'll use the LET command again as was described in number 15.

9. In 98, I think you'll want to separate the left and right data into separate sets of columns. One way to use the UNSTACK command, described at the end of the Chapter 3 material in the MINITAB Guide. Another way is to "cut and paste". In order to do part d, you'll need to deal with residuals. See the notes to number 99 just below. Also, you'll want to put in a new column of the numbers 1-20, that gives time order, so you can do the residual plots requested in part d.

10. In 99, you'll need to use a subcommand to REGRESS to save the residuals (page 52) so that you can plot them. What should go on the vertical axis? See page 53 at the top. This is completely standard. We always make residual plots this way, just as we always write from left to right on the page. Also notice that if you choose Residual plots under the Regression menu, it DOESN'T give you the plot you need. That's because the menu in MINITAB is more focused on doing multiple regression -- a more sophisticated procedure than we're using -- and the analysis of residuals is more complicated there. Follow the example in the MINITAB Guide for residual plots.

Chapter 3: 7, 28

1. Do number 28 first and then do number 7 in the same way. The data file for this is not provided. Instead of typing in all the names, it's less work to type in names than to assign IDs to the people and then using the SET command to put the IDs in column 1. Then SAMPLE from the IDs.

Chapter 4: 11, 13, 40, 47

1. In 11, here's how I'd do it (with commands) for 20 trials, showing my commands and the output. The last part, about printing the data, is an easy, concise way to show my work as I count the "runs".

   MTB > random 20 c1;
   SUBC> bern 0.5.
   MTB > tally c1;
   SUBC> percents.

   Summary Statistics for Discrete Variables
   \begin{verbatim}
   C1  Percent
   0  45.00
   1  55.00
   \end{verbatim}

   MTB > print c1
   \textbf{Data Display}
   \begin{verbatim}
   C1
   1 0 1 1 0 0 0 0 1 0 1 0 1 1 1 0 1 1 0 1
   \end{verbatim}
2. In 40, put the student grades into c1. Then do one of the following:

**Easy to understand, but tedious:** Use the SAMPLE command 10 times, storing your first sample in c11, next in c20, etc. After doing all, then DESC c11-c20 to see all sample means at once. Then copy those numbers by hand and enter them into another column and make a histogram.

**More difficult to understand, but easy to do:** (This easily extends to larger sample sizes.) Use these commands to get 10 samples of size 4, with each sample in one row, then use RMEAN to find the mean of each sample and put those means in c9, and then do a histogram of those means.

```plaintext
MTB > samp 10 c1 c3
MTB > samp 10 c1 c4
MTB > samp 10 c1 c5
MTB > samp 10 c1 c6
MTB > rmean c3-c6 into c8
MTB > name c8 'xbar4'
MTB > hist c8
```

3. In 47, the data is in ex01-80.mtp. Make the histogram on the computer and print it out. Use the computer to find the mean of the data. By hand, mark that on your histogram. Then sample as you did in chapter 3 and put each sample into a separate column. Use DESC to find the sample mean of each column and then mark them on your histogram.

**Chapter 6:** 5, 19, 35, 77

**In all problems asking for confidence intervals or hypothesis tests, part of your answer must be a verbal interpretation of the results in terms of the original question. In other words, even if it just asks you to find a P-value, you must write an interpretation as well.**

1. In 5, use the computer to do parts a and b. Then use the computer to find the sample mean and do part b by hand as well. (Show that you get the same results.)

2. In 77 we have the same problem as before with the year data. Again, we don't need those numbers, so ignore them. Also note that when the data is given in percentages, and the standard deviation in percentages, you should use both as is, or convert both to decimals. You should NOT use one as is and convert the other to decimals.

**Chapter 7:** 9, 33, 35, 43, 74, 75, 76

**In all problems asking for confidence intervals or hypothesis tests, part of your answer must be a verbal interpretation of the results in terms of the original question. In other words, even if it just asks you to find a P-value, you must write an interpretation as well.**

1. Before going to the computer problems in this chapter it would be interesting to redo Chapter 6, numbers 5 and 35, but without assuming a known standard deviation. That means use TINTERVAL rather than ZINTERVAL and using TTEST rather than ZTEST. Compare the results to those you got in Chapter 6. That shows how little it matters to the result when you leave out the assumption that the standard deviation is known.

2. In 9, if you're using a version of MINTAB older than version 12, it doesn't have the Paired t-test option. However, you can easily do a test by using the LET command to put the differences in a third column and do a t-test of one variable on that column.

3. In 35 and 43, I think it is easier to use the menus rather than commands. Contrast the degrees of freedom that the computer uses (from the more accurate levels from the text, page 402-403) with what you would use by hand. What effect would that have on the length of the confidence intervals? (Optional: If you are really interested in exploration of the concepts, do the problem again making the assumption that the population standard deviations are equal and using the pooled subcommand. Again, what effect did that have on the degrees of freedom and the size of the confidence interval?)
4. Think of 74, 75, and 76 as a project for the city's Environmental Department manager. The data is in ta07-08.mtp. What do you think is most reasonable to do about missing data? What did the software package do about it?

**Chapter 8:** 11, 21, 41, 49

In all problems asking for confidence intervals or hypothesis tests, part of your answer must be a verbal interpretation of the results in terms of the original question. In other words, even if it just asks you to find a P-value, you must write an interpretation as well.

If you are using an earlier version of MINITAB than Version 12, the commands discussed in this chapter aren't available. You would need to use a macro to do the tests and confidence intervals on proportions. It's probably easier to go to the lab and use Version 12 to do these problems or just do them by hand if your instructor agrees.

1. In 11, read page 140 of the MINITAB Guide at the top for an example of PONE. The first paragraph on that page explains what the USEZ subcommand does. I think it is interesting to do the computation once without that subcommand and another time with the subcommand. Notice that the results are somewhat different, but not very different. This shows how much the normal approximation differs from the exact value.

**Chapter 9:** 13, 21, 23

In all problems asking for confidence intervals or hypothesis tests, part of your answer must be a verbal interpretation of the results in terms of the original question. In other words, even if it just asks you to find a P-value, you must write an interpretation as well.

1. In 13, of course there is no data file because you enter the table yourself.

2. In 21, use the computer software for part c. Again, enter the data yourself. When programmers who either don't know or aren't careful about statistical computations write statistics software, this is a mistake they are likely to make. Obviously, you should avoid using such software.

**Chapter 11:** 7, 21, 25

Some students do most of the Chapter 2 computer homework just looking at the graphs as output and never looking at the output in the Session window. That wasn't good in chapter 2, and isn't acceptable here. You must learn to interpret almost all of the output in the Session window. Look at it!!

In this chapter, pay particular attention to making and using residual plots. Recall that, when you choose Residual plots from the Regression menu, it doesn't give you the residual plot we are looking at. That's because the menu in MINITAB is more focused on doing multiple regression -- a more sophisticated procedure than we're using -- and the analysis of residuals is more complicated there. Review the material in Chapter 2 of the MINITAB Guide about how to do regression with the software. Also, notice how MINITAB identifies influential points. At this point, you should be about to interpret (almost) all of the computer output of a REGRESS command to describe and use the relationship between two quantitative variables.
Student Information for a Mathematics Course

Name: _____________________________________________________________

Social Security Number: ________________________________

email address: _______________________________________________________

Address: ______________________________________________________________________

City and Zip Code: ______________________________________________________________________

Home Phone: ______________________ Work Phone:_______________________

Major: ______________________________________________________________________

Educational Goal: (Associate's Degree from ACC, Bachelor's Degree from ??, other)
____________________________________________________________________

Name and number of this course: _____MATH 1342: Elementary Statistics_________

Name and course number of the prerequisite for this course:
High school Algebra II or having passed TASP or 39+ on COMPASS Algebra test

I met the prerequisite in the following way (what course or test, your grade, and what year).
____________________________________________________________________

I am taking ______ credit hours and am working _______ hours per week.

I understand that my instructor may drop me from the course if I do not have the proper prerequisite course. I also understand that failure to give accurate information about prerequisites is scholastic dishonesty. I affirm that the information I have given here about my fulfillment of the prerequisite is accurate.

Signature:___________________________________       Date: ___________________