MA 181 **REVIEW SHEET FOR TEST #1 - SPRING, 2006**
Riseberg

Test #1 will be given on Thursday, February 9. It will include material from Sections 1.1, 1.2, 2.1, 2.2, 2.3 and 2.4.

MAKEUP POLICY REMINDER:

If you know in advance that you have to miss a quiz or test, you can make arrangements with me to take the quiz or test **before** it is given in class. Otherwise, no makeup quizzes will be given. If you miss an hour test, it may be made up only if you

1. Contact me on or before the scheduled test date. My office telephone number is 301-279-5215. If I am not there, leave a message stating your telephone number clearly and telling me when I can reach you.
2. Can prove that you have a legitimate excuse.
3. Show me all homework on the relevant material.

If you do not meet these conditions, you will not be permitted to take a makeup test and the percentage equivalent of your final exam grade will be substituted for the grade of the missed test. No student will be permitted to take more than one makeup test.

If you have documentation showing that you need extended time for tests, you must discuss this with me at least two days before the scheduled test date.

To be prepared for this test, you should be able to

- Use function notation to evaluate functions algebraically and graphically.
- Translate the verbal statement of a problem into an algebraic model and use this model to solve the problem algebraically or graphically.
- Recognize and classify a function by type.
- Find a linear model to fit given data ***without*** using the STAT feature of your calculator and interpret the slope.
- Determine the slope of the secant and tangent lines to the graph of a function from a table of data, from a formula for the function, and from a graph.
- Determine the average and instantaneous velocity of an object if information about its position is given by a table of data, a formula, or a graph.
- Evaluate limits as $x \to a$, $x \to a^-$, or $x \to a^+$ (where a is a finite number) numerically, graphically and algebraically.
- Interpret information about limits graphically.
- Use the Squeeze Theorem to determine a limit.
- ***Use the three part definition of continuity*** to show whether or not a function is continuous at a given value of x. This involves knowing this definition ***exactly.***
- List the discontinuities of a function if the formula for the function or if the graph of the function is given.
- State the intervals on which a function is continuous.
- Use the Intermediate Value Theorem to show the existence of a solution to a given equation.

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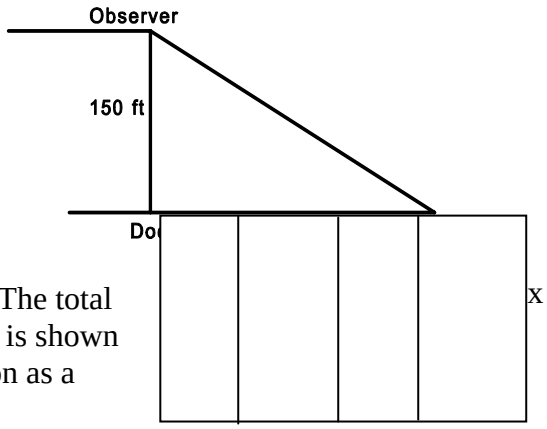
Exercises for Review

Chapter 1 Review (p. 83)	**Chapter 2 Review (p. 175)**
Concept Check: 6, 7, 8 Exercises: 22	Concept Check: 1(a) - (c), 2, 4, 9, 10 True-False: 4, 5, 6, 7 Exercises: 1 (a) parts (i) - (iv), 1 (d), 3, 4, 5, 7, 8, 10, 19, 21, 23, 25

Additional Review Exercises

1. An observer atop a cliff sees a speedboat approaching a dock located at the base of the cliff directly below the observer. Express the distance from the observer to the boat as a function of the distance from the boat to the dock, if the cliff is 150 feet high.



2. A farmer wants to enclose a rectangular area and then divide it into four smaller rectangular regions by putting up fencing parallel to one side of the rectangle. The total amount of fencing available is 500 feet. An illustration is shown at the right. Express the total area of the enclosed region as a function of x and simplify your answer.

3. During the years 1986 – 1991, the population of the world appeared to be increasing linearly. In 1986, the world population (in millions) was 4936 and in 1990 it was 5329.

(a) ***Without using the STAT menu of your calculator,*** find a linear equation that models the world population as a linear function of time in years after 1986 (t = 0 corresponds to 1986).

(b) Write a sentence explaining the meaning of the slope in this equation. Be sure to use units in your answer. Begin your sentence as follows: The slope of _____means that

(c) Use your equation to estimate the current world population.

4. Numerically determine the value of each of the following limits, if possible. If the limit does not exist, explain why.

(a) $\lim_{x\to 5}\dfrac{\ln x - \ln 5}{x-5}$ (b) $\lim_{x\to 3}\dfrac{|x^2-9|}{3-x}$

5. Sketch the graph of a function which satisfies all of the following conditions:

6. f(1) = -2, f(3) = 5, $\lim_{x\to 1^-} f(x) = 2$, $\lim_{x\to 1^+} f(x) = 5$, and $\lim_{x\to 3} f(x) = 7$.

7. Find the limit: $\lim_{h\to 0}\dfrac{\sqrt{x+h}-\sqrt{x}}{h}$

8. Find all values of k such that f is continuous for all x if $f(x) = \begin{cases} x+1 & if\ x < k \\ x^2 & if\ x \geq k \end{cases}$

In addition, you should go over all worksheets, homework problems, and quizzes.