

Test #1 will be given on Monday, February 22. It will include material from Sections 1.1, 1.2, and 2.1 – 2.5. Using the STAT menu of your calculator will not be on the test.

Be sure to bring your calculator to the test. If you forget your calculator or if your calculator is not working, go to the Math/Science Center in Room 02 Macklin Tower to get a short-term calculator loan.

### **IMPORTANT REMINDERS**

**MAKEUP POLICY:** 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 a test, it may be made up only if you

- Do not have more than one unexcused absence during the time period covered on the test.
- Contact me on or before the scheduled test date.
- Can prove that you have a legitimate excuse.
- Either have completed the EWA homework on the relevant material or 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.**

**ACADEMIC HONESTY:** All students are expected to do their own work on quizzes and tests. Students are expected to observe the following rules during any test or quiz.

- Students may not use or even hold a cell phone, ipod, or any other electronic device (other than a calculator). **Any student who is found to have such a device turned on during a test or quiz will receive a grade of zero on that test or quiz.**
- Students may not speak to or share materials with other students.
- Students should have all materials ready at the beginning of the quiz or test.
- Students should remain in the room during the entire test or quiz.

Appropriate penalties will be imposed for breaches of academic honesty.

**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 data **without** using the STAT menu 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.
- **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.

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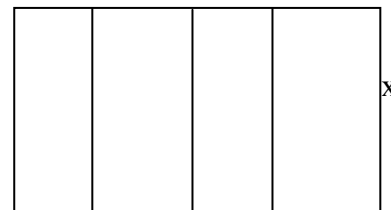
- Use the Intermediate Value Theorem to show the existence of a solution to a given equation.
- Evaluate limits as  $x \rightarrow a$ ,  $x \rightarrow a^-$ ,  $x \rightarrow a^+$ , numerically, graphically, and analytically. If a limit is undefined because the function is becoming infinite, determine if the function is approaching  $\infty$  or  $-\infty$ .
- Evaluate limits as  $x \rightarrow \infty$  or  $x \rightarrow -\infty$  numerically, graphically, and analytically.
- Determine the vertical and horizontal asymptotes of a function.
- Sketch the graph of a function that satisfies given conditions.

### Exercises for Review

<b>Chapter 1 Review (p. 80)</b> Concept Check: 6, 7, 8 Exercises: 3, 22	<b>Chapter 2 Review (p. 164)</b> Concept Check: 1, 5, 7, 8, 9, 10 True-False: 4, 5, 7, 12 Exercises: 1 – 10, 12, 14, 15, 23 (a) and (b), 25, 27
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### Additional Review Exercises

1. 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.



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

(a)  $\lim_{x \rightarrow 5} \frac{\ln x - \ln 5}{x - 5}$

(b)  $\lim_{x \rightarrow 3} \frac{|x^2 - 9|}{3 - x}$

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

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

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

5. Let  $f(x) = \frac{2x^2 + 5x - 3}{7(x^2 - x - 12)}$ .

- (a) **Analytically** (without using your calculator) determine all vertical and horizontal asymptotes of  $f(x)$ .

- (b) **Analytically** (without using your calculator) determine  $\lim_{x \rightarrow -3} f(x)$ .

- (c) At what value or values of  $x$  is  $f(x)$  discontinuous?

Note: Your answers should be fractions or whole numbers, not decimals.

**In addition, you should go over your notes, worksheets, homework problems, and quizzes. Remember that you can get extra help from me, from classmates, or by going to the Math/Science Center.**