MA 160 **REVIEW SHEET FOR TEST #2 - Spring 2014**

Test #2 will be given during second week of March. It will include material from Sections 2.3 – 3.6 and 25 Points From Your Test 1. 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 an hour 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.
- Show me all homework on the relevant material, and be able to take the test prior to March 14.

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 or any other electronic device.
- 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.

If you have documentation showing that you require 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

- Find derivatives using rules of differentiation.
- Find second derivatives.
- Solve problems involving tangent lines and slope.
- Find velocity and acceleration if the formula for distance is given.
- Find average and instantaneous rates of change.
- Interpret the derivative verbally in a sentence
- Use the derivative in applications, including, but not limited to, marginal cost, revenue and profit.
- Determine from a graph where a function is increasing or decreasing, where it has a relative maximum or minimum, where it is concave up or down, and where it has an inflection point.
- Use the first derivative to find critical points of a function, determine where a function is increasing or decreasing, and where it has a relative maximum or minimum

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- Use the second derivative to find points of inflection and determine where a function is concave up and where it is concave down
- Use the Second Derivative Test to determine whether a function has a relative maximum or minimum at a critical point
- Sketch graphs based on information obtained from the first and second derivatives.

TO PREPARE FOR THIS TEST,

★ Make sure that you can do all homework and worksheet problems.
★ Read the textbook and go over your notes.
★ Make sure you know all the important formulas and properties.
★ Do the following supplementary exercises and additional review problems.

Suggested Study Plan:

Please complete your WebAssign HW and review Worksheets 2.3--3.6

Additional Review Problems:

1. Annual consumption of bottled water in the United States has been increasing since 1990. Based on past data, the function $f(t) = 0.016t^2 + 0.12t + 2.18$ models the bottled water consumption (in billions of gallons) in the year that is t years since 1990.

(a) Find $f(15)$ and write a sentence using everyday language stating what this means.

(b) Find $f'(15)$ and write a sentence using everyday language stating what this means.

2. A function f is continuous and differentiable for all x. Its first and second derivatives are given by:

$f'(x) = (x-2)(x-6)^3$

$f''(x) = 4(x-3)(x-6)^2$ **Note that you are <u>not</u> given the function f .**

(a) List the critical values of f .
(b) On what interval(s) is f increasing? Decreasing?
(c) List the **x-coordinates** of any points at which f has a local maximum. A local minimum.
(d) List the **x-coordinates** of any possible inflection points of f .
(e) On what interval(s) is f concave up? Concave down?
(f) List the **x-coordinates** of any points at which f actually has a point of inflection.
(g) Suppose it is also known that f goes through the point (0, 0). Based on your answers to parts (a) – (g) above, sketch a possible graph of f. Remember, you have not been given a formula for f. You must use the information you obtained in parts (a) – (g).

You can get extra help from me, by going to the **Math/Science Center** (MT 02)