MATH 19 – Exam 2 Details

The second exam will take place in class on Thursday, November 7. You will have the whole class period to take the exam. The exam is closed notes and closed book. You are allowed a scientific or graphing calculator. You WILL NOT be permitted to use any other technology (such as calculators on phones) or other resources during the exam. **Please note that academic integrity violations will be taken seriously, and will be met with serious consequences.**

The exam covers sections 3.3-3.6 and 4.1,4.2,4.5,4.3 (this is the order we covered them in class). The topics you should know are:

- **3.3 Product and Quotient Rule** – know the rules and how to use them to compute derivatives.
- **3.4 Chain Rule** – know the rule and how to use it to compute derivatives. Recall that there are only three different cases that apply to us

  $$\text{i. } (f(x))^n, \qquad \text{ii. } e^{f(x)}, \qquad \text{iii. } \ln(f(x)).$$

- **3.5 Implicit Differentiation** – i.e. use implicit differentiation to find dy/dx for the implicitly defined curve $e^y = x^2 + y^2$. Remember that this is just an application of the chain rule. You should also remember how to find the equation of the tangent line.
- **3.6 Related Rates** – applying implicit differentiation to solve real-world problems. Review the three examples we covered in class, plus the quiz example.
- **4.1 First Derivative and Graphs** – Find where a function is increasing/decreasing, find partition numbers of f' (critical numbers of f), and find local extrema. SIGN CHARTS! (again)
- **4.2 Second Derivative and Graphs** – Find where a function is concave up/concave down, find partition numbers of f'', and find points of inflection. SIGN CHARTS! (again again)
- **4.5 Absolute Maximum and Minimum** – Find the absolute maximum and minimum of a function on an interval $[a, b]$.
- **4.3 L'Hopital's Rule** – Recognize limits which are in indeterminate form $0/0$ or $\pm\infty/\pm\infty$. Know L'Hopital's rule and how to evaluate these limits using the rule (may need to apply it more than once).

To give you an idea of what to prioritize: about 40% of the exam will be weighted just towards taking derivatives (Section 3.3 and 3.4). About 10-15% will will involve implicit differentiation (Section 3.5). About 10% will involve related rates (Section 3.6). About 25% will involve finding describing the graph of a function: where is f increasing/decreasing, concave up/down, local extrema, points of inflection, absolute max & min (Section 4.1: 10% + Section 4.2: 10% + Section 4.5: 5% = 25%). About 5-10% will be weighted towards L'Hopital's Rule.

Study resources:

- Class notes, quiz 5-7
- **Exam 2 Practice (the actual exam will be very similar)**
- Extra practice: "Exam 2 Review" on MyLab Math – There are 70+ questions from which you can practice. The frequency of problem types is NOT related to how much the exam will weight that type. You should identify where your weaknesses are and spend time on those problems.
- Office hours: Tues & Fri 12-1:30pm. Other times by appointment.
- Help sessions: Mon-Thurs 5-7pm (I'll be there Mon 5-6pm).