Exam 3 Review **October 2020**
Calculus I **Prof. Nollet**

Look at home work, quizzes and examples from class, but practice is most important! Can you do similar problems without your book?

Exam 3 covers sections 4.1 and 4.3,4.4,4.5, 4.6 and 4.8. Section 4.4 may be weighted more heavily because it covers two ideas, concavity and graphing.

4.1 Absolute max/mins, a **continuous** function f(x) has an absolute max and min on a **closed** interval [a,b], find them by looking at critical points on (a, b) and comparing to endpoints, relative max/mins.

4.3 Increasing/decreasing functions, test with the derivative sign on a number line, first derivative test for relative max/mins.

4.4 Definition of concavity, finding concavity with second derivative, inflection points, the second derivative test for relative max/mins. Sketch graphs from various data, like $f'(x)$, signs of f' and f'', relative extrema, $f''(x)$, concavity, horizontal and vertical asymptotes, intercepts.

4.5 L'Hospital's rule for computing limits of the form $\lim_{x\to c} \dfrac{f(x)}{g(x)}$ when the limiting values of $f(x)$ and $g(x)$ have the forms $\dfrac{0}{0}$ or $\dfrac{\pm\infty}{\pm\infty}$. Rule also works for $c = \pm\infty$. Check that these forms are in play or the rule fails. Know how to deal with situations where you need to rewrite as a fraction or take a logarithm.

4.6 Optimization problems. Draw picture if one is not provided for geometric problems, name variables and relationships among them. Most important step is writing the function that you need to maximize or minimize. Look at home work problems and examples form class.

4.8 Antiderivatives, Indefinite integrals, integration constant, solve initial value problems.