

Exam 3 covers Sections 3.8 (on differentials), 4.1 (Related rates), 4.2 (Max and min), 4.3 (Derivatives and shapes of curves), and 4.5 (Indeterminate forms and L'Hôpital's Rule). Pay particular attention to the Suggested Exercises and to definitions.

Section 3.8: Know the definition of the differential of a function $f(x)$. Know how to use differentials to estimate a small change in f due to a small change dx in x .

Section 4.1: Know how to do the suggested exercises and study the worked examples in the section and from lecture. For word problems, study how to draw the proper diagram and how to label the variables.

Section 4.2: Know the definition of critical number. Be able to identify the critical numbers of f on a graph of f . Know how to find the absolute min and max of a continuous function on a closed bounded interval.

Section 4.3: Know the Mean Value Theorem. Know how to tell where f is increasing or decreasing from a sign diagram of its derivative f' , and how to use this to find the max and min of f . Know the definition of concave up and concave down. Know how to find where the graph is one or the other.

Section 4.5: Know how to use L'Hôpital's Rule to find limits of indeterminate forms. Know what indeterminate form means, and how to attack each kind.

In every section, do the suggested exercises and review how they are done.