

Study guide for quiz 06

Quiz problems include both the lecture contents and homework problems.

1. Section 4.2: Study the statements, proofs and applications of Rolle's Theorem and Mean Value Theorem. Be careful about the difference between Intermediate Value Theorem and Mean Value Theorem.
2. Section 4.3: Study how to determine whether a critical point is a local minimum, local maximum, or neither using the first derivative test.
3. Section 4.4: Review procedures for sketching a curve. Such as how to determine whether the curve is increasing/decreasing and concave up/down.
4. Section 4.5, Part 1 (Basic Indeterminate Forms): Review how to find the limits of indeterminate forms like $\frac{0}{0}$, $\frac{\infty}{\infty}$, $0 \cdot \infty$ and $\infty - \infty$ cases using L'Hôpital's Rule. Roughly Examples 1-6 and Exercises 1-50.
5. Section 4.5: Derive and memorize asymptotic behaviors of exponential functions, polynomials and logarithmic functions. That is, which of them is the 'largest' at infinity? which of them is the 'smallest'? Why? Also study their counter part as $\lim_{x \rightarrow 0+}$.
6. Section 4.5: Find an example of the form $\frac{0}{0}$ that L'Hôpital's Rule does not leads to an answer, but after rewriting $\frac{0}{0} = \frac{\frac{1}{0}}{\frac{1}{0}} = \frac{\infty}{\infty}$, L'Hôpital's Rule can be applied to find the limit.