

AB CALCULUS MIDTERM EXAM REVIEW TOPICS

Limits and Continuity – Chapter 2

- Graphical Representations of Limits
 - 1 sided limits
 - 2 sided limits
 - Limits approaching infinity

- Computational Techniques of Limits

The Basics

- Sums and differences
- Products and Quotients
- Roots
- Constants
- Forms of $\frac{1}{x}$
- nth roots

Polynomials

- As $x \rightarrow a$
- As $x \rightarrow \pm\infty$

Rational Functions

L'Hopital's Rule

As $x \rightarrow a$ resulting in quotient, $\frac{0}{0}$, $\frac{0}{\text{constant}}$, $\frac{\text{constant}}{0}$

As $x \rightarrow \pm\infty$

Radicals

Continuous functions and absolute value

Piecewise Functions

- Continuity/Differentiability
 - Point Continuity Definition
 - $\lim_{x \rightarrow c} f(x) = f(c)$
 - Cusp and vertical tangency

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Derivatives – Chapter 3 and Chapter 4

- Applications of the derivative
 - Slope of a secant line
 - Average rates of change
 - Average velocities
 - Slope of a tangent line
 - Instantaneous rates of change
 - Instantaneous velocities
 - Find equations of tangent lines
 - Linear Approximation
 - Related Rates
- Derivative Rules
 - Constants
 - Power Rule
 - Constant times a function
 - Sums and Differences
 - Product Rule
 - Quotient Rule
 - Reciprocal Rule
 - Higher Derivatives $f^{(n)}(x)$
 - Trig Functions
 - Log/Ln
 - Exponential
 - Inverse Trig
- Derivatives from a limit (2 forms)
- Chain Rule
 - Function notation
 - Reading a table/graphs
 - Double chain rule
- Implicit Differentiation
- Logarithmic Differentiation
- Derivatives of inverses of $f(x)$

Graphing – Chapter 5

- Critical points, Stationary points, Intervals of Increase and Decrease, Concavity, Inflection Points, cusp and points of vertical tangency
- First and second derivative tests
- Absolute/Relative Maximum and Minimum
- Rolle's Theorem and Mean Value Theorem
- Optimization
- Particle Movement