MCV4U

What's On the MCV4U Exam

Rates of Change

Include:

- Average vs instantaneous rate of change
- Concept of limit
- Left and right hand limits
- Finding limits algebraically - direct substitution, factoring, rationalizing, common denominator
- Finding a derivative from first principles
- Continuity

Exclude:

- Limits of numeric sequences
- Finding limits using a table of values

Derivatives

Include:

- Constant, constant multiple, sum and difference, power, product, quotient and chain rules
- Equation of tangent
- Second derivative
- Displacement, velocity, acceleration

Exclude:

- Proofs of derivative rules
- Marginal cost, revenue, profit
- Sketching a graph of a derivative from a graph of a function

Curve Sketching

Include:

- Increasing and decreasing functions
- Local and absolute maxima and minima
- First derivative test
- Second derivative test
- Concavity and points of inflection
- Symmetry and asymptotes
- Sketching graphs of polynomial and rational functions

Exclude:

- Sketching a graph of a function from a graph of a derivative

Optimization Problems

Include:

- Steps for solving an optimization problem
- What to do when there are no critical numbers

Exclude:

- Examples involving exponential and logarithmic functions
- Examples involving trigonometric functions

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Derivatives of Trigonometric & Exponential Functions

Include:

- Derivatives of sin x, cos x
- Problems involving power, product, quotient and chain rules
- Equation of tangent
- The number e
- The natural logarithm
- Derivatives of e^x, b^x
- Exponential growth and decay
- Derivatives of composite functions involving exponential, logarithmic, trigonometric and polynomial functions
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Exclude:

- Pendulums
- AC-DC coupled circuits
- Proofs of derivative rules
- Optimization problems

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Geometric Vectors

Include:

- True bearings and quadrant bearings
- Vector properties
- Scalar multiplication of vectors
- Linear combinations of vectors
- Applications of vector addition
- Vector components
- Equilibrant vector
- Tension questions

Cartesian Vectors

Include:

- Unit vectors
- Magnitude
- Linear combinations of vectors
- Applications of vector addition
- Dot product
- Cross product
- Vectors in two-space and three-space
- Applications of dot and cross product

Lines and Planes

Include:

- Vector, parametric and scalar equations of lines and planes
- Intersections of lines
- Intersection of line and plane
- Intersection of planes

Exclude

- Shortest distance between skew lines, line and plane, two planes