

General Instructions:

The exam will be in two parts. You are allowed two 3"x5" index cards on which anything may be written. On the first part, you may use no materials other than a writing utensil, not even a calculator. On the second part of the exam, you also may use a graphing calculator.

I have listed those ideas, techniques, and methods that I will expect you to know.

Sections: 2.7, 3.1-3.10, 4.1-4.9, 5.1-5.8

Definitions:

function f	domain and range of f	derivative of f
slope of a secant	slope of a curve	average velocity
velocity	acceleration	limit
exponential function	logarithmic function	differential
absolute max (min)	stationary point	critical point
local max (min)	endpoint	increasing (decreasing) function
concavity	second derivative	equation of a tangent line
differential	linear approximation	anti-derivative
inverse function		

Derivative Formulas:

sin(x), cos(x), tan(x)	cot(x), sec(x), csc(x)	y = c, y = x
coefficient rule	power rule	sum rule
product rule	quotient rule	chain rule
implicit differentiation	sin ⁻¹ (x), tan ⁻¹ (x), sec ⁻¹ (x)	ln(x), e ^x

Anti-derivative Formulas:

coefficient rule	power rule	sum rule
chain rule	sin(x), cos(x), sec ² (x)	csc ² (x), sec(x)tan(x), csc(x)cot(x)
1/x, e ^x	Guess and check	$\frac{1}{\sqrt{1-x^2}}$, $\frac{1}{1+x^2}$, $\frac{1}{ x \sqrt{x^2-1}}$
u substitution		

Integration:

definite integral	indefinite integral	Fundamental Theorem of Calc
approximate integration	u substitution	change of variable

Theoretical Notions:

numerical functions	graphs of functions	inverses of functions
definition of derivatives	max – min search	definite integral (limits)
l’hopital’s rule	Newton’s method	fundamental theorem of calc
Intermediate Value Theorem		

Problem Guarantees:

Computations of a derivative from the limit definition
Computations of derivatives using a variety of rules
Computations of anti-derivatives or indefinite integrals using a variety of rules
Max – min problem (no related rate problem)
Proof of one theoretical piece: either the fundamental theorem of calculus or l’hopital’s rule

Trigonometry:

Graphs of sin, cos, tan, sec	Graphs of arcsin, arctan, arcsec
Special values of trig functions and inverses	