

# CALCULUS MADE EASY - FUNCTIONALITY

for the TiNspire CAS – [www.TiNspireApps.com](http://www.TiNspireApps.com)

## Functions

READ: Linear Functions  
Find Slope  
Find  $y=mx+b$   
All-in-one-Function Explorer  
Evaluate Function  
Find Domain of  $f(x)$   
Find Range of  $f(x)$   
Intersection of 2 Functions  
Composition of 2 Functions  $f(g(x))$   
Do the Quadratic Equation  
Complete the Square  
Find  $[f(x+h)-f(x)]/h$   
Find Inverse function  
READ: Interval Notation  
Newton Method  
READ: Intermediate Value Theorem

## Limits

READ: Limit Rules  
L'Hopital Rule  $0/0$  or  $\infty/\infty$   
Compute 1- and 2-sided Limits  
Continuity of piecewise-defined function  
READ: Definition of 2-Sided Limit & Continuity  
READ: Definition of Continuity

## Derivatives

Find  $[f(x+h)-f(x)]/h$   
Average Rate of Change  
Find  $f'(x)=\lim [f(x+h)-f(x)]/h$  as  $h \rightarrow 0$   
Instantaneous Rate of Change  
Evaluate Derivatives; Tangent- & Normalline  
Find Point Slope &  $y=mx+b$  given Pt & Slope  
READ: Differentiation Rules  
Step by Step Differentiation  
Higher Derivatives with Evaluation  
Critical Points  
Points of Inflection & Concavity  
Mean Value Theorem  
Rolle's Theorem  
Implicit Differentiation

Slope of Inverse Function  
All in one Rate Explorer  
Differentiability of piecewise-defined function  
Absolute and Percent Change  
Differentials  
APPS: Max Volume of Folded Box  
APPS: Min Distance Point to Function  $f(x)$   
APPS: Related Rates Find  $dy/dt$

## Integrals

READ: Integration Rules  
Step by Step Integration  
Find Antiderivative & Constant of Integration:  $\int f(x)dx + C$   
Definite Integrals (Netarea)  
1. Fundamental Theorem of Calculus  
2. Fundamental Theorem of Calculus  
Average Value Theorem  
Find Total Area  $\int |f(x)| dx$   
Find Enclosed Area  $\int U(x)-L(x)dx$   
Area Approx. LRAM  
Area Approx. LRAM  
Integration of Piecewise defined Function  
Compute  $\int (\text{Rate})dt$   
APPS: CURVE LENGTH of  $f(x)$   $\int \sqrt{1+f'(x)^2}dx$   
APPS: VOLUME - Disk Method about x-axis  
APPS: VOLUME - Washer Method about x-axis  
APPS: VOLUME - Shell Method about y-axis  
APPS: VOLUME - Washer Method about y-axis  
APPS: VOLUME - Known Cross Sections  
APPS: SURFACE AREA (x and y-axis)  
READ: Integration by Trig Substitution

## Differential Equations

Solve any 1. order Differential Equation  
Separation of Variables  
Euler Method  
Solve any 2nd order Differential Equations

## Horizontal & Vertical Motion

Given Position  $s(t)$   
Given Velocity  $v(t)$   
Given Acceleration  $a(t)$

## Sequences & Series

- Explicit Sequence & Partial Sum
- Recursive Sequence & Partial Sum
- Sequence Formula Finder
- Sigma S-Notation
- Geometric Series & Convergence Test
- Nth Term Test for Divergence
- Integral Test
- p-Series Test
- Alternating Series Test
- Ratio Test
- Find Sum and Partial Sums
- Develop Taylor Series using Definition
- Taylor Series with Error Bound
- Compose 2 Taylor Series

## Parametric Equations

- Evaluate and Derivatives
- Tangents
- Curve Length
- Enclosed Area
- Volume of Solids
- Surface Area of Solids

## Vectors & Vector Valued Functions

- READ: Vector Rules
- 2D: Vector Length
- Given Position  $s(t)=(x(t))$
- Given Velocity  $v(t)=(x'(t))$
- 3D: Unit Vector

## Polar Equations

- Polar Coordinates  $\rightarrow (x,y)$
- READ: Symmetry of Polar Equations
- Find Intersection of Polar Functions
- Evaluate and Differentiate  $d\theta/dr$
- Find  $dy/dx$
- Find Tangent Line
- Horizontal and Vertical Tangents
- Area
- Curve Length
- Find Angle  $\theta$  given  $x$  and  $r(\theta)$

Find Angle  $\Theta$  given  $y$  and  $r(\Theta)$

## Multivariable Calculus

Partial Derivatives and Gradient

Relative Extrema of  $f(x)$

Directional Derivative

Multiple Integrals:  $\iint f(x,y)dydx$

Multiple Integrals:  $\iiint f(x,y,z)dzdydx$

Convert 3D Coordinates

Laplace Transforms

## Algebra & Trigonometry

Solve any Equation or Inequality

Intersection of 2 Functions

Simplify Expression

Factor

Expand/Distribute

Partial Fractions

READ: Intro

Convert Degree  $\leftrightarrow$  Radian

Evaluate Trig Functions

READ: Trig Identities

READ: Hyperbolics

READ: TRIG-DERIVATIVES

READ: TRIG-INTEGRALS

READ: Unit Circle: Angles & Coordinates

READ Circle Properties & Formulas

Find Circle Sector

## Exponents & Logarithms

READ: Exponents & Rules

Solve any Equation

Solve using the Rule 72

Solve Money/Exponential Growth Problems

READ: Logarithms & Rules

Evaluate Logarithms

Logarithm Solver

Change of Base

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