CALCULUS WITH PHYSICS APPLICATIONS - FUNCTIONALITY

for the TiNspire CAS CX – www.TiNspireApps.com

Physics Apps

- Center of Mass (2D)
- 1. Moment of Mass about x and y-axis
- Mass of Lamina - f(x)
- Mass of Lamina - f(y)
- Radius of Gyration (x-axis)
- Radius of Gyration (y-axis)
- 1. & 2. & 3. Moment of Inertia about x-axis
- 1. & 2. & 3. Moment of Inertia about y-axis
- 3 Moments of Inertia of a Solid
- Mass of a Solid
- Moments of Mass of Solid (3D)
- Center of Mass of Solid (3D)
- Heat Transfer
- Hydrostatic Force
- Work= Integral of Force
- Fluid Force

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 8/8
- 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->8
Instantaneous Rate of Change
Evaluate Derivatives; Tangent- & Normalline
Find Point Slope & y=mx+b given Pt & Slope
READ: Differentiation Rules
Step by Step Differentation
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: ∫f(x)dx + C
Definite Integrals (Netarea)
1. Fundamental Theorem of Calculus
2. Fundamental Theorem of Calculus
Average Value Theorem
Find Total Area ∫|f(x)|dx
Find Enclosed Area ∫U(x)-L(x)dx
Area Approx. LRAM
Area Approx. LRAM
Integration of Piecewise defined Function
Compute ∫(Rate)dt
APPS: CURVE LENGTH of f(x) ∫(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 -> (x,y)
- READ: Symmetry of Polar Equations
- Find Intersection of Polar Functions
- Evaluate and Differentiate dϴ/dr
- Find dy/dx
- Find Tangent Line
- Horizontal and Vertical Tangents
- Area
- Curve Length
- Find Angle ϴ given x and r(ϴ)
- Find Angle ϴ given y and r(ϴ)

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 <-> 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

Help & About
Help & Use of Keys
What to Input
About us
Set FontSize