

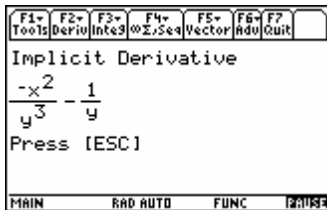
Calculus Tools TI-89 Titanium, TI-92 Plus and Voyage 200™

This user-friendly application extends the build-in power of your TI-89 and TI-92 Plus by providing more specialized functionality. Use Calculus to investigate applications of differentiation, compare numerical integration techniques and explore sequences, series, vector calculus, Fourier series and more!

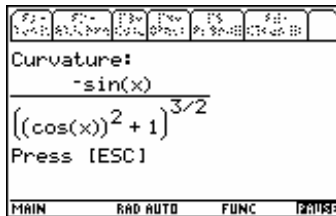
Some Calculus Tools features worth showing:

F2: Deriv (Applications of Derivatives Menu)

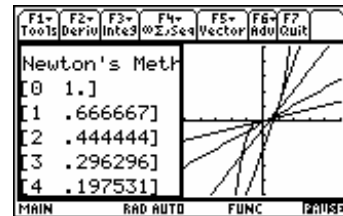
Teachers frequently ask if TI-89 or TI-92 performs implicit differentiation. It does not, but this functionality is provided in the **Calculus Tools App**. Other useful tools are: finding the curvature and center of curvature of an expression, finding equation of lines tangent and perpendicular to an expression at a given point and Newton's method.



Press F2: 1 to compute implicit 2nd derivative of $y^2 + x^2 = 1$ with respect to x



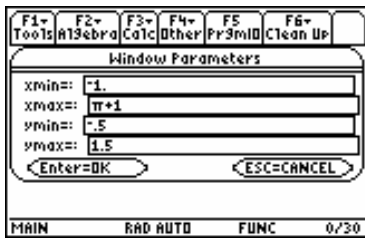
Press F2:2 to find the curvature of $y = \sin(x)$



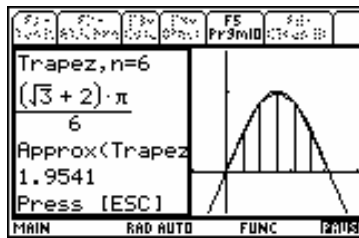
Press F2:7 to explore Newton's method for $y = x^2$ with initial guess $x_0 = 1$

F3: Integ (Numerical Integration Menu)

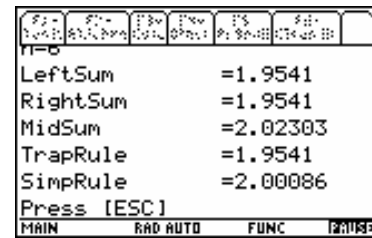
Calculus Tools offers computation of Riemann sums using left, right and midpoint evaluation points, trapezoidal and Simpson's rules as well as a comparison tool that lets the user compare the accuracy of the above methods for a given function for n intervals.



Press F1:1 Graph Window to choose the appropriate window parameters.



Press F3:4 to illustrate the trapezoidal rule for $f(x) = \sin(x)$ on the interval $[0, \pi]$ with $n=6$



Press F3:6 to compare various numerical integration techniques and note that Simpson's rule is the most accurate one, since

$$\int_0^{\pi} \sin(x) dx = 2$$