Steepest descent

Integrals

Steepest descent for integrals is a contour-deformation-based method to derive asymptotic expansions.

Quadrature routines can be used along deformed contours for numerical computations.

Riemann–Hilbert problems

Nonlinear steepest descent (due to Deift & Zhou) is the extension of the method for integrals to RH problems.

Numerical methods can be used along these deformed contours for accurate evaluation (Numerical nonlinear steepest descent).

The KdV equation with decaying data

Using simple Fourier methods