

**Meeting:** 1003, Atlanta, Georgia, MAA CP X1, MAA General Contributed Paper Session, I

1003-X1-248      **Eric C Nummela\*** (nummele@richmond.ac.uk), Richmond University, Queens Road, TW10 6JP  
Richmond, Surrey, England. *Theoretical Error Bounds for Numerical Integration.*

The trapezoidal rule and Simpson's rule are often used to find numerical approximations to integrals of reasonably smooth functions when only functional values at equally spaced ordinates over a closed interval are known, and upper bounds for the possible error in the approximation are well known. We derive integration formulas and error bounds when cubic splines are used to approximate the unknown function. The integration formulas and the error bounds depend on a Fibonacci-like recurrence relation, and therefore also on the number of data points used. (Received September 03, 2004)