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/* Compute the integral from a to b of f(x)dx using Romberg integration. The method
converges provided that f(x) is continuous in (a,b). tol indicates the desired relative
accuracy in the integral. Written by E. Bertschinger. */ #include #include #define
MAXITER 16 #define MINITER 4 #define MAXJ 5 double rombint(f,a,b,tol) double
f(),a,b,tol; { int i=0,j,k,nint,jmax; double g[MAXJ+1],gmax,g0,g1,fourj,h,error;
h=0.5*(b-a); gmax=h*(f(a)+f(b)); g[0]=gmax; nint=1; error=tol; while (i < MAXITER
&& (i++ < MINITER || fabs(error) > tol)) { /* Calculate next trapezoidal rule
approximation to integral. */ g0=0.0; for (k=0; k < MAXJ) jmax=MAXJ; fourj=1.0; for
(j=0; j < jmax) error=1.0-gmax/g0; else error=gmax; gmax=g0; g[jmax]=g0; } if (i >=
MAXITER && fabs(error) > tol) printf("Rombint failed to converge; integral, error=%g
%g\n", g0,error); return(g0); }

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