syms x n xi

a = 0;b = 1;fx =x^3\*sin(x);rou = 1;

fxx = sym(fx);rouu = sym(rou);

A = [int(x\*rouu,a,b),int(rouu,a,b);int(rouu\*x^2,a,b),int(rouu\*x,a,b)];

B = [int(rouu\*x^2,a,b); int(rouu\*x^3,a,b)];

xx = inv(A)\*(-B);

pnx = poly2sym([1 xx']);

X = roots(sym2poly(pnx));

Y = subs(fxx,'x',X);

for i = 1:length(X)

l=1;

for j = 1:length(X)

if i ~= j

l=(xi - X(j))/(X(i) - X(j))\*l;

end

end

AA(1,i) = int(l^2\*rou,a,b);

end

XX = subs(fxx,'x',X);

At=[vpa(AA\*XX,8)-vpa(int(fx,a,b),8),vpa(AA\*XX,8);]

结论：与上节课的Newton-Cotes公式n=1 n=2的情形，复化梯形公式、复化simpson公式四个函数进行误差对比，发现高斯的积分公式最终的结果更加精确。精确级提升了e级别。