**数值分析实践报告（八）**

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| **一、实验项目名称： 数值积分** | | | | | |
| **二、实验目的：熟悉并掌握复合辛普森法、Romberg法求数值积分** | | | | | |
| **三、实验内容：八\_1、P154练习8.4----对不同的进行实验；八\_2、P162练习8.11---三个积分都做，按照表8.3写报告。** | | | | | |
| **四、程序设计**  % 练习 8.4 n=10 时  sn1=0;  sn2=0;  x1=0.1:0.1:0.9;  x2=0.05:0.1:0.95;  for i=1:9  sn1=sn1+sin(x1(i))/x1(i);  end  for j=1:10  sn2=sn2+sin(x2(j))/x2(j);  end  sn=(1+sin(1)/1+4\*sn2+2\* sn1)/60  %练习 8.4 n=20 时  sn1=0;  sn2=0;  x1=0.05:0.05:0.95;  x2=0.025:0.05:0.975;  for i=1:length(x1)  sn1=sn1+sin(x1(i))/x1(i);  end  for j=1:length(x2)  sn2=sn2+sin(x2(j))/x2(j);  end  sn=(1+sin(1)/1+4\*sn2+2\* sn1)/120 | | | %练习 8.11 (1)  interval=[-1,1];  a=interval(1);b=interval(2);  h=b-a;  syms x  y=sin(x)/x;  Told=eval(subs(y,x,a))+eval(subs(y,x,b));  Sold=NaN;Cold=NaN;Rold=NaN;  A=[0,Told,Sold,Cold,Rold];  Tnew=0.5\*Told+0.5\*h\*1;  Snew=(4\*Tnew-Told)/3;  Cnew=(16\*Snew-Sold)/15;  Rnew=(64\*Cnew-Cold)/63;  A=[A;1,Tnew,Snew,Cnew,Rnew];  h=h/2;  for i=2:10  intervalx=a+h/2:h:b-h/2;  sumy=0;  for j=1:length(intervalx)  sumy=sumy+eval(subs(y,x,intervalx(j)));  end  Tnew=0.5\*Told+0.5\*h\*sumy;  Snew=(4\*Tnew-Told)/3;  Cnew=(16\*Snew-Sold)/15;  Rnew=(64\*Cnew-Cold)/63;  A=[A;i,Tnew,Snew,Cnew,Rnew];  h=h/2;  Told=Tnew;Sold=Snew;Cold=Cnew;Rold=Rnew;  end  A | | |
| %练习 8.11 (2)  interval=[0,3];  a=interval(1);  b=interval(2);  h=b-a;  syms x  y=x\*sqrt(1+x^2);  Told=eval(subs(y,x,a))+eval(subs(y,x,b));  Sold=NaN;Cold=NaN;  Rold=NaN;  A=[0,Told,Sold,Cold,Rold];  for i=1:9  intervalx=a+h/2:h:b-h/2;  sumy=0;  for j=1:length(intervalx)  sumy=sumy+eval(subs(y,x,intervalx(j)));  end  Tnew=0.5\*Told+0.5\* h\*sumy;  Snew=(4\*Tnew-Told)/3;  Cnew=(16\*Snew-Sold)/15;  Rnew=(64\*Cnew-Cold)/63;  A=[A;i,Tnew,Snew,Cnew, Rnew];  h=h/2; Told=Tnew;  Sold=Snew;Cold=Cnew;Rold=Rnew;  end  A | | | %练习 8.11 (3)  interval=[0,3];  a=interval(1);  b=interval(2);  h=b-a;  syms x  y=x^(5/2);  Told=eval(subs(y,x,a))+eval(subs(y,x,b));  Sold=NaN;Cold=NaN;Rold=NaN;  A=[0,Told,Sold,Cold,Rold];  for i=1:9  intervalx=a+h/2:h:b-h/2;  sumy=0;  for j=1:length(intervalx)  sumy=sumy+eval(subs(y,x,intervalx(j)));  end  Tnew=0.5\*Told+0.5\*h\*sumy;  Snew=(4\*Tnew-Told)/3;  Cnew=(16\*Snew-Sold)/15;  Rnew=(64\*Cnew-Cold)/63;  A=[A;i,Tnew,Snew,Cnew,Rnew];h=h/2;  Told=Tnew;Sold=Snew;Cold=Cnew;Rold=Rnew;  end  A | | |
| **五、实验结果（包含图表）**  **练习8.4中，时， 时**  **练习8.11中，求的表格结果为**    **求的表格结果为**    **求的表格结果为** | | | | | |
| **六、实验结果分析（实验总结、心得体会）**  **通过本次实验，学习了复合辛普森法、Romberg 法求数值积分，掌握了运用他们来求积分。** | | | | | |

**注：如果报告超过1页，需双面打印。**