1、试求解极限问题。

>> syms x a b;

>> f=x\*((1+a/x)^x)\*sin(b/x);

>> L=limit(f,x,inf)

L =

exp(a)\*b

2、已知，求

>> syms x y z;

>> f=sin(x^2\*y)\*exp(-x^2\*y-z^2);

>> L=diff(diff(diff(f,x,2),y,1),z,1)

L =

-4\*cos(x^2\*y)\*z\*exp(-x^2\*y-z^2)+40\*cos(x^2\*y)\*y\*x^2\*z\*exp(-x^2\*y-z^2)-16\*sin(x^2\*y)\*x^4\*y^2\*z\*exp(-x^2\*y-z^2)-16\*cos(x^2\*y)\*x^4\*y^2\*z\*exp(-x^2\*y-z^2)+4\*sin(x^2\*y)\*z\*exp(-x^2\*y-z^2)

3、计算积分

>> syms x y;

>> f=sin((pi\*x)/(2\*y));

>> L=int(int(f,y,sqrt(x),x),x,1,2)

L =

(2\*pi^3-cosint(1/2\*pi)\*pi^4+2\*pi^2\*cos(1/2\*2^(1/2)\*pi)-8\*cos(1/2\*2^(1/2)\*pi)-4\*2^(1/2)\*pi\*sin(1/2\*2^(1/2)\*pi)+pi^4\*cosint(1/2\*2^(1/2)\*pi)-2^(1/2)\*pi^3\*sin(1/2\*2^(1/2)\*pi)+4\*pi)/pi^3



4、已知：求。

>> syms x y z;

>> f=-4\*z\*exp(-x^2\*y-z^2)\*(cos(x^2\*y)-10\*cos(x^2\*y)\*y\*x^2+4\*x^4\*sin(x^2\*y)\*y^2+4\*cos(x^2\*y)\*x^4\*y^2-sin(x^2\*y));

>> L=int(int(int(2\*x\*f,x),y),z)

L =

2\*x^2\*(1/2/(-x^2+i\*x^2)/exp(x^2\*y)/exp(z^2)\*exp(i\*x^2\*y)+1/2\*i/(-x^2+i\*x^2)/exp(x^2\*y)/exp(z^2)\*exp(i\*x^2\*y)+2\*x^4/(-x^2+i\*x^2)^2/exp(x^2\*y)/exp(z^2)\*exp(i\*x^2\*y)\*y-2\*i\*x^4/(-x^2+i\*x^2)^2/exp(x^2\*y)/exp(z^2)\*exp(i\*x^2\*y)\*y+2\*x^2/(-x^2+i\*x^2)^2/exp(x^2\*y)/exp(z^2)\*exp(i\*x^2\*y)-1/2\*i/(-x^2-i\*x^2)/exp(i\*x^2\*y)/exp(x^2\*y)/exp(z^2)+1/2/(-x^2-i\*x^2)/exp(i\*x^2\*y)/exp(x^2\*y)/exp(z^2)+2\*i\*x^4/(-x^2-i\*x^2)^2/exp(i\*x^2\*y)/exp(x^2\*y)/exp(z^2)\*y+2\*x^4/(-x^2-i\*x^2)^2/exp(i\*x^2\*y)/exp(x^2\*y)/exp(z^2)\*y+2\*x^2/(-x^2-i\*x^2)^2/exp(i\*x^2\*y)/exp(x^2\*y)/exp(z^2))

5、分别对y=sinx进行8,10,16阶的Taylor幂级数展开。次的近似效

>> syms x;

>> f=sin(x);

>> y1=taylor(f,x,8)

y1 =

x-1/6\*x^3+1/120\*x^5-1/5040\*x^7

>> y2=taylor(f,x,10)

y2 =

x-1/6\*x^3+1/120\*x^5-1/5040\*x^7+1/362880\*x^9

>> y3=taylor(f,x,16)

y3 =

x-1/6\*x^3+1/120\*x^5-1/5040\*x^7+1/362880\*x^9-1/39916800\*x^11+1/6227020800\*x^13-1/1307674368000\*x^15

6、求解

>> syms n;

>> s=symsum(2/((2\*n+1)\*(2\*x+1)^(2\*n+1)),n,0,inf)

s =

1/(2\*x+1)\*(4\*x^2+4\*x+1)^(1/2)\*log((1+1/(4\*x^2+4\*x+1)^(1/2))/(1-1/(4\*x^2+4\*x+1)^(1/2)))

7、求解，*l*曲线为y=x与y=x2的交线

>> syms x y;

>> f=x^2+y^2;

>> y=x;

>> y=x^2;

>> L=int(f\*sqrt(1+diff(y,x)^2),x,0,1)

L =

9/32\*5^(1/2)+1/64\*log(-2+5^(1/2))+1/2\*y^2\*5^(1/2)-1/4\*y^2\*log(-2+5^(1/2))

8、求解，*l*为抛物线y=x2（-1≤x≤1）。

>> syms x y;

>> syms t;

>> x=t;y=t^2;

>> F=[x^2-2\*x\*y,y^2-2\*x\*y];

>> ds=[diff(x,t);diff(y,t)];

>> I=int(F\*ds,t,-1,1)

I =

-14/15