Контрольная работа №1

Вариант 3

**№1**

>> grid on

>> hold on

>> r=10\*pi;

>> t=0:pi/10:2\*pi;

>> x1=r.\*cos(t);

>> y1 = r.\*sin(t);

>> plot(x1,y1,'k-')

>> r=5\*t;

>> x=r.\*cos(t);

>> y = r.\*sin(t);

>> plot(x,y,'r-')



>> f=@(x)sqrt((5\*x)^2+25);

>> syms x

>> dl=int(f,x,0,2\*pi)

dl =

(5\*asinh(2\*pi))/2 + 5\*pi\*(4\*pi^2 + 1)^(1/2)

>> (5\*asinh(2\*pi))/2 + 5\*pi\*(4\*pi^2 + 1)^(1/2)

ans =

106.2815

**№2**

>> syms n

>> int('1/(n\*sqrt(log(n)))',n,2,inf)

ans =

Inf

Расходится Интегральный признак Коши

function [Sn04,Sn03,Sn02,Sn01,Sn0] = SumR(f,n0)

x=1:n0;

y=subs(f,'x',x);

y1(1)=subs(f,'x',n0);

for i=2:n0

y1(i)=y1(i-1)+subs(f,'x',i);

end

Sn0=0;

for i=1:n0

Sn0=Sn0+subs(f,'x',i);

end

Sn01=Sn0-subs(f,'x',n0);

Sn02=Sn01-subs(f,'x',n0-1);

Sn03=Sn02-subs(f,'x',n0-2);

Sn04=Sn03-subs(f,'x',n0-3);

hold on;grid on;

plot(x,y,'or');

plot(x,y1,'xg');

legend('term','sum');

end



>> SumR('1/(x\*sqrt(log(x)))',100)

ans =

Inf

**№3**

>> syms n

>> limit('exp(2\*(n+1)+1)/factorial(n+1)/exp(2\*n+1)/factorial(n)',n,inf)

ans =

0

Ряд Сходится,признак Даламбера

function [Sn,n] = AsRm(f,eps)

Sn=0;

n=1;

q = subs(f,'x',n+1)/subs(f,'x',n);

Rn = subs(f,'x',n+1)/(1-q);

while (abs(Rn)>eps)

Sn = Sn + subs(f,'x',n);

q = subs(f,'x',n+1) / subs(f,'x',n);

Rn = subs(f,'x',n+1 )/ (1-q);

n = n+1;

end

end

>> [Sn,n]=AsRm('exp(2\*x+1)/factorial(x)',0.001)

Sn =

4.3959e+003

n =

26

>> format long

>> [Sn,n]=AsRm('exp(2\*x+1)/factorial(x)',0.001)

Sn =

4.395945194982189e+003

n =

26

**№4**

>> limit('((n^(1/5))/(n-10)^(1/5))',n,inf)

ans =

1

Ряд Абсолютно сходится, предельный признак сравнения