|  |
| --- |
| [Название организации] |
| БДЗ №1 |
| [Подзаголовок документа] |

|  |
| --- |
| Тюльников Михаил Пин-12  [Дата] |



|  |  |  |
| --- | --- | --- |
|  | MatLab | Тетрадь |
| (1) | 28 | 70 |
| (0.1) | 217 | 244 |
| (0.01) | 2107 | 2444 |
| (0.001) | 21007 | 24444 |

>> syms n

>> a=limit((3\*n^4+6\*n)/(n^4-7\*n^3+1),n,inf)

a =

3

>> a=3;

>> vpasolve((3\*n^4+6\*n)/(n^4-7\*n^3+1)-3==1,n)

ans =

0.39119514143263824451518240170844

28.007466911046636320704133785899

- 0.19933102623963728260965809380363 - 0.5703955329840023002158014759389i

- 0.19933102623963728260965809380363 + 0.5703955329840023002158014759389i

>> vpasolve(-((3\*n^4+6\*n)/(n^4-7\*n^3+1)-3)==1,n)

ans =

-14.031200266950002082045896915775

0.28069500050810541473209716497969

- 0.12474736677905166634310012460216 - 0.70160331584331522284474403896796i

- 0.12474736677905166634310012460216 + 0.70160331584331522284474403896796i

>> x=[0.39119514143263824451518240170844, 28.007466911046636320704133785899, -14.031200266950002082045896915775, 0.28069500050810541473209716497969];

>> y=[0 0 0 0];

>> plot(x,y,'or')

>> hold on, grid

>> x=-20:.1:35;

>> y=abs((3.\*x.^4+6.\*x)./(x.^4-7.\*x.^3+1)-3)-1;

>> plot(x,y)



>> n0=28;

>> epsilon=1;

>>lab5

SCRIPT lab5

figure (2)

k=n0;

n=k-5:1:k+10;

y=(3.\*n.^4+6.\*n)./(n.^4-7.\*n.^3+1);

a1=a;

eps=epsilon;

hold on, grid

plot(n,y,'o')

line([k-5 k+10], [a1-eps a1-eps],'Color','red')

line([k-5 k+10], [a1+eps a1+eps],'Color','red')

axis equal



# Номер 2



|  |  |  |
| --- | --- | --- |
|  | MatLab | Тетрадь |
| (0.01) | 0.0123 | 0.0093 |
| (0.001) | 0.0012 | 0.0009 |

>> syms x

>> x0=5;

>> a=limit((x^3-7\*x-90)/(x^2-2\*x-15),x,5)

a =

17/2

>> x1= vpa(solve((x^3-7\*x-90)/(x^2-2\*x-15)-a-0.01,x));

>> x2= vpa(solve(-((x^3-7\*x-90)/(x^2-2\*x-15)-a)-0.01,x));

>> x1=eval(x1);

>> x2=eval(x2);

>> X=[x1' x2'];

>> delta=min([abs(X-x0)])

delta =

0.0123

>> x=4.98:0.00001:5.02;

>> y=(x.^3-7.\*x-90)./(x.^2-2.\*x-15);

>> plot(x,y)

>> line([x0-delta x0-delta],[y(1) y(4000)],'Color','red')

>> line([x0+delta x0+delta],[y(1) y(4000)],'Color','red')

>> line([x(1) x(4000)],[a+0.01 a+0.01],'Color','red')

>> line([x(1) x(4000)],[a-0.01 a-0.01],'Color','red')

>> plot(x0,a,'or')



>> x1= vpa(solve((x^3-7\*x-90)/(x^2-2\*x-15)-a-0.001,x));

>> x2= vpa(solve(-((x^3-7\*x-90)/(x^2-2\*x-15)-a)-0.001,x));

>> x1=eval(x1);

>> x2=eval(x2);

>> X=[x1' x2'];

>> delta=min([abs(X-x0)])

delta =

0.0012

>> x=4.9987:0.00001:5.0012;

>> y=(x.^3-7.\*x-90)./(x.^2-2.\*x-15);

>> plot(x,y)

>> hold on, grid

>> line([x(1) x(250)],[a-0.001 a-0.001],'Color','red')

>> line([x(1) x(250)],[a+0.001 a+0.001],'Color','red')

>> line([x0+delta x0+delta],[y(1) y(250)],'Color','red')

>> line([x0-delta x0-delta],[y(1) y(250)],'Color','red')

>> plot(x0,a,'or')



# Номер 3



>> x=2.95:0.0001:3.05;

>> y=(sqrt(x+13)-2.\*sqrt(x+1))./(x.^2-9);

>> plot(x,y)

> hold on,grid

>> x0=3;

>> syms x

>> y0=limit((sqrt(x+13)-2\*sqrt(x+1))/(x^2-9),x,3)

y0 =

-1/16

>> plot(x0,y0,'or')



# Номер 4



>> x0=pi/2;

>> y0=limit((x-pi/2)\*cot(2\*x),x,pi/2)

y0 =

1/2

>> x1=1.5:0.0001:1.6;

>> y1=(x1-pi/2).\*cot(2.\*x1);

>> plot(x0,y0,'or')

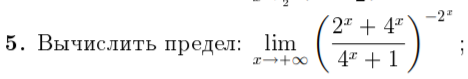
>> hold on,grid

>> plot(x1,y1)

>> axis equal



# Номер 5



>> syms x

>> a=limit(((2^x+4^x)/(4^x+1))^(-2^x),x,+inf)

a =

1/exp(1)

>> x=9:0.1:30;

>> y=((2.^x+4.^x)./(4.^x+1)).^(-2.^x);

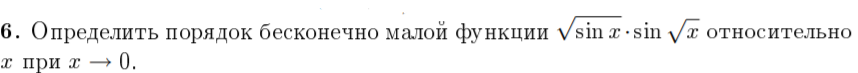
>> plot(x,y)

>> hold on, grid

>> plot(30,a,'or')



# Номер 6



>> C=1;

>> x0=0;

>> p=1;

>> x=-0:0.0001:0.05;

>> y=sqrt(sin(x)).\*sin(sqrt(x));

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

>> hold on,grid

>> g=C.\*(x-x0).^p;

>> plot(x,g,'b')

>> plot(x0,y(1),'ro')



# Номер 7



>> C=1;

>> x0=1;

>> p=1;

>> x=0.95:0.0001:1.05;

>> y=x.\*log(x);

>> plot(x,y)

>> hold on,grid

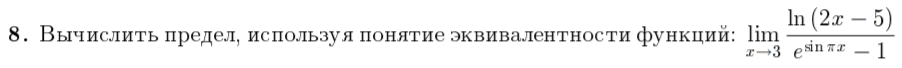
>> g=C.\*(x-x0).^p;

>> plot(x,g);

>> axis equal



# Номер 8



>> syms x

>> a=limit(log(2\*x-5)/(exp(sin(x\*pi))-1),x,3)

a =

-2/pi

>> x0=3;

>> plot(x0,a,'or')

>> hold on,grid

>> x=2.9:0.0003:3.1;

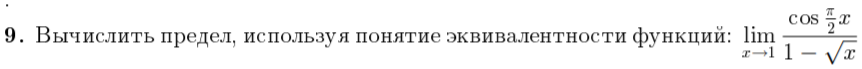
>> y=log(2.\*x-5)./(exp(sin(x.\*pi))-1);

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

>> y2=2.\*x./(-pi.\*x);

>> plot(x,y2,'b') 

# Номер 9



>> syms x

>> a=limit(cos(pi/2\*x)/(1-sqrt(x)),x,1)

a =

pi

>> x=0.9:0.0001:1.1;

>> y=cos(pi./2.\*x)./(1-sqrt(x));

>> y2=pi.\*x./x;

>> x0=1;

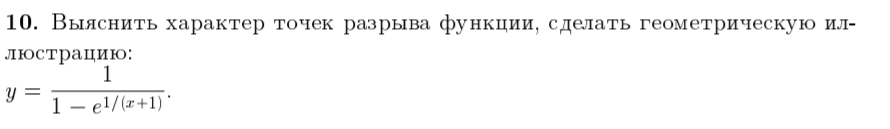
>> plot(x,y,'r')

>> hold on,grid

>> plot(x,y2,'b')

>> plot(x0,a,'ro')

# Номер 10



>> hold on,grid

>> x=-1:.001:0;

>> y=1./(1-exp(1./(x+1)));

>> plot(x,y)

>> x2=-2:0.001:-1.001;

>> y2=1./(1-exp(1./(x2+1)));

>> plot(x2,y2)

>> x=[-1 -1];

>> y=[1 0];

>> plot(x,y,'or')

