**Исламов Радмир Лабараторная 1**

**Задание 1**

>> p=poly(1:20)

roots(p)

ans =

20.0003

18.9972

18.0112

16.9711

16.0483

14.9354

14.0653

12.9491

12.0334

10.9840

10.0061

8.9984

8.0003

7.0000

6.0000

5.0000

4.0000

3.0000

2.0000

1.0000

>> p(2)=p(2) + 10^-7

roots(p)

ans =

-0.3064 + 1.4438i

-0.3064 - 1.4438i

-0.0036 + 0.2407i

-0.0036 - 0.2407i

0.0358 + 0.1261i

0.0358 - 0.1261i

0.0453 + 0.0779i

0.0453 - 0.0779i

0.0474 + 0.0501i

0.0474 - 0.0501i

0.0466 + 0.0314i

0.0466 - 0.0314i

0.0444 + 0.0177i

0.0444 - 0.0177i

0.0413 + 0.0071i

0.0413 - 0.0071i

0.0383

0.0300

0.0200

0.0100

**Задание 2**

>> 2^1023

2^2024

ans =

8.9885e+307

ans =

Inf

**Задание 3**

>> format long e

sqrt(2)

format double

sqrt(2)

ans =

1.414213562373095e+000

**Задание 4**

>> format long e

10^8+10^-7

10^8+10^-8

ans =

1.000000000000001e+008

ans =

1.000000000000000e+008

**Задание 5**

>> format long e

x=1;

for c=1:10^6

x = x+10^-16;

end

disp(x)

x=0;

for c=1:10^6

x = x+10^-16;

end

x=x+1;

disp(x)

ans =

1

ans =

1.0000

Задание 6

>> n=1;

e=@(n)2^-n;

>> while((1+e(n)-1)/(e(n)==1))

n=n+1;

end

>> n

n =

53

**Задание 7**

>> n=1;

f=@(x,n)x^n\*exp(x-1);

syms x

for n=1:30

n=n+1; int(f(x,n),x,0,1)

end

format long e

n=1;

f=@(x,n)x^n\*exp(x-1);

syms x

for n=1:30

n=n+1;

subs(int(f(x,n),x,0,1))

end

ans =

2.642411176571153e-001

ans =

2.072766470286539e-001

ans =

1.708934118853843e-001

ans =

1.455329405730786e-001

ans =

1.268023565615284e-001

ans =

1.123835040693008e-001

ans =

1.009319674455933e-001

ans =

9.161229298966059e-002

ans =

8.387707010339417e-002

ans =

7.735222886266420e-002

ans =

7.177325364802956e-002

ans =

6.694770257561571e-002

ans =

6.273216394138015e-002

ans =

5.901754087929777e-002

ans =

-5.764607523034235e+017

ВЫШЛО ОТРИЦАЬЕЛЬНОЕ ЗНАЧЕНИЕ

ans =

5.277111916899476e-002

ans =

5.011985495809426e-002

ans =

4.772275579620910e-002

ans =

4.554488407581805e-002

ans =

4.355743440782089e-002

ans =

4.173644302794031e-002

ans =

4.006181035737290e-002

ans =

3.851655142305043e-002

ans =

3.708621442373924e-002

ans =

3.575842498277981e-002

ans =

3.452252546494532e-002

ans =

3.336928698153123e-002

ans =

3.229067753559440e-002

ans =

3.127967393216808e-002

ans =

3.033010810278951e-002

**Задание 8**

function [res]=sinRyad(x)

res = 0; i = 0;

while (x^(2\*i + 1)/factorial(2\*i + 1) > 10^-17)

res = res + (-1)^i\*x^(2\*i+1)/factorial(2\*i + 1);

i = i + 1;

end

end

>> Ex7(0), Ex7(pi/3), Ex7(pi/2), Ex7(pi), Ex7(2\*pi)

ans =

0

ans =

0.8660

ans =

1.0000

ans =

3.3312e-016

ans =

3.3012e-015

>> Ex7(12\*pi), Ex7(13\*pi), Ex7(14\*pi)

ans =

0.1140

ans =

13.1806

ans =

445.1056