Лабораторная работа 5.

Задание 1.

```
int main() {
    int N = 0;
    for (size_t power: {2, 4, 6, 7, 8, 9}) {
        N = pow(10, power);
        float sumN = 0;
        float sum2N = 0;

        for (size_t i = 0; i < N; ++i)
            sumN += (1 / float(N));

        for (size_t i = 0; i < 2*N; ++i)
            sum2N += (1 / float(N));

        printf("sum of 10^%ld numbers: %f\n", power, sumN);
        printf("sum of 2*10^%ld numbers: %f\n", power, sum2N);
    }

    return 0;
}
```

```
sum of 10^2 numbers: 0.999999
sum of 2*10^2 numbers: 1.999998
sum of 10^4 numbers: 1.000054
sum of 2*10^4 numbers: 2.000219
sum of 10^6 numbers: 1.009039
sum of 2*10^6 numbers: 1.962713
sum of 10^7 numbers: 1.064767
sum of 2*10^7 numbers: 2.000000
sum of 10^8 numbers: 0.250000
sum of 2*10^8 numbers: 0.250000
sum of 10^9 numbers: 0.031250
sum of 2*10^9 numbers: 0.031250
```

```cpp
int main() {
    int N = 0;
    for (size_t power: {2, 4, 6, 7, 8, 9}) {
        N = pow(10, power);
        double sumN = 0;
        double sum2N = 0;

        for (size_t i = 0; i < N; ++i)
            sumN += (1 / double(N));

        for (size_t i = 0; i < 2*N; ++i)
            sum2N += (1 / double(N));

        printf("sum of 10^%ld numbers: %el\n", power, sumN);
        printf("sum of 2*10^%ld numbers: %el\n", power, sum2N);
    }

    return 0;
}
```

```
sum of 10^2 numbers: 1.000000e+00l
sum of 2*10^2 numbers: 2.000000e+00l
sum of 10^4 numbers: 1.000000e+00l
sum of 2*10^4 numbers: 2.000000e+00l
sum of 10^6 numbers: 1.000000e+00l
sum of 2*10^6 numbers: 2.000000e+00l
sum of 10^7 numbers: 1.000000e+00l
sum of 2*10^7 numbers: 2.000000e+00l
sum of 10^8 numbers: 1.000000e+00l
sum of 2*10^8 numbers: 2.000000e+00l
sum of 10^9 numbers: 1.000000e+00l
sum of 2*10^9 numbers: 2.000000e+00l
```

Задание 2.

```c
#include <stdio.h>
#include <math.h>

double calc(double x) {
    return sin(2 * x) + cos(3 * x);
}

int main() {
    double x;
    scanf("%le", &x);

    double y = calc(x);
    printf("sin(%le) + cos(%le) = %le\n", 2 * x, 3 * x, y);
    return 0;
}
```

Задание 3.

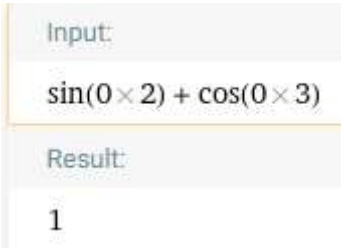
```c
#include <stdio.h>
#include <math.h>


extern "C" double calc(double x);

int main() {
    double x;
    scanf("%le", &x);

    double y = calc(x);
    printf("calc(%le) = %le\n", x, y);
    return 0;
}
```

```
        .text
        .globl  calc
        .type   calc, @function
calc:
        subq    $24, %rsp
        movsd %xmm0, 8(%rsp)
        addsd  %xmm0, %xmm0
        call    sin
        movsd %xmm0, (%rsp)
```

```
        movsd 8(%rsp), %xmm1
        addsd   %xmm1, %xmm1
        addsd   8(%rsp), %xmm1
        movapd          %xmm1, %xmm0
        call      cos
        addsd  (%rsp), %xmm0
        addq    $24, %rsp
        ret
```

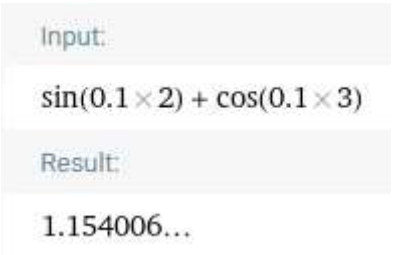
0

sin(0.000000e+00) + cos(0.000000e+00) = 1.000000e+00



0.1

sin(2.000000e-01) + cos(3.000000e-01) = 1.154006e+00



0.2

sin(4.000000e-01) + cos(6.000000e-01) = 1.214754e+00

Input:

$\sin(0.2 \times 2) + \cos(0.2 \times 3)$

Result:

1.21475…