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Вычмат, 5 лаба

12 вариант

```
#include <iostream>
#include <cmath>
using namespace std;
//4 вариант
float f1(float x)
{
	return 1 / sqrt(x * x - 1);
}

	float f2(float x)
	{
		return (log(x*x + 7)/ (x*x - 1));
	}

	//метод трапеций
	float trap(float a, float b)
	{
		float x, w = 0;

		int n = 8;

		double result1, result2, p, h;

		p = 0.001; //точность

		//метод трапеций
		while (true)
		{
			h = (b - a) / n;
			for (int k = 1; k < n; k++)
			{
				x = a + k * h;
				w = w + f1(x);
			}
			w = (2 * w + f1(a) + f1(b)) * (h / 2);
			return w;

			n++;

			h = (b - a) / n;
			for (int k = 1; k < n; k++)
			{
				x = a + k * h;
				w = w + f1(x);
```

```
45.                 }
46.                 w = (2 * w + f1(a) + f1(b)) * (h / 2);
47.                 return w;
48.
49.                 //если достигли заданной точности
50.                 if (abs(result2 - result1) < p)
51.                 {
52.                       break;
53.                 }
54.                 n++;
55.           }
56.
57.           return result2;
58.
59.     }
60.
61.     double pogr()
62.     {
63.           int n = 8;
64.           return 80 * 1 / (180 * pow(n, 4));
65.     }
66.
67.     //метод Симпсона
68.     float simp(float a, float b)
69.     {
70.           int m = 4;
71.
72.           int n = 2 * m;
73.
74.           double s1 = 0, s2 = 0;
75.
76.           double h = (b - a) / n;
77.
78.           double s;
79.
80.           double x;
81.
82.           for (int k = 1; k <= m; k++)
83.           {
84.                 x = a + (2 * k - 1) * h;
85.                 s1 = s1 + f2(x);
86.           }
87.           for (int k = 1; k < m; k++)
88.           {
89.                 x = a + 2 * k * h;
90.                 s2 = s2 + f2(x);
91.           }
92.           s = (4 * s1 + 2 * s2 + f2(a) + f2(b)) * h / 3;
93.
94.           return s;
```

```
95.     }
96.
97.     int main()
98.     {
99.         double a = 2.3, b = 3.3;
100.        cout << "Trapeciya: " << trap(a, b) << endl << endl;
101.
102.
103.        a = 1.8, b = 2.4;
104.        cout << "Simpson: " << simp(a, b) << endl << endl;
105.
106.        cout << "Pogreshnost: " << pogr() << endl;
107.    }
```