ТИПОВОЙ РАСЧЕТ

Интегрирование .

Содержит 14 задач.

Задача 4.1. Вычислить неопределенный интеграл.

№	$\int f(x)\,dx$
1	$\int \left(\frac{3x^2}{\sqrt{x}} - 6e^{2x-5} + \frac{1}{4x^2-9}\right) dx$
2	$\int \left(-4x^3 + \frac{1}{\cos^2(3x+1)} - \frac{6}{9x^2+1}\right) dx$
3	$\int \left(\frac{3\cdot 2^x - 2\cdot 3^x}{2^x} - 4\sqrt{2x+1} + \frac{1}{\sqrt{1+4x^2}}\right) dx$
4	$\int \left(\frac{3}{\sqrt{9x^2+1}} + \sin(7x-3) - 4^{2x}\right) dx$
5	$\int \left(5x\sqrt{x} - 3\cos(6x-1) + \frac{1}{8+2x^2}\right) dx$
6	$\int \left(\frac{3x^2+\sqrt{x}}{x} + \frac{1}{\sqrt{x^2+7}} - 2\sin(4x+2)\right) dx$
7	$\int \left(\frac{9x^3}{\sqrt{x}} - \frac{2}{\sqrt{4-x^2}} + \frac{3}{2}e^{3x+5}\right) dx$
8	$\int \left(\frac{3}{x^2-9} + 5\cos\frac{x}{3} - 3^{2x-3}\right) dx$
9	$\int \left(\frac{x^2-5}{x} + \frac{9}{\sin^2(3x-1)} - \frac{1}{x^2+4}\right) dx$

10	$\int \left(\frac{7x^6 - 2}{x^2} + 4e^{2x-7} + \frac{1}{9x^2 - 4} \right) dx$
11	$\int \left(7x^4 - 25\cos(5x + 2) + \frac{3}{\sqrt{9x^2 + 4}} \right) dx$
12	$\int \left(\frac{1}{\cos^2(3x - 7)} + \frac{4}{x^3} + \frac{1}{\sqrt{4 - 9x^2}} \right) dx$
13	$\int \left(\frac{4}{\sqrt{16x^2 - 9}} - \frac{5x^2 + 2x\sqrt{x}}{x^3} + 3 \cdot 7^{3x-1} \right) dx$
14	$\int \left(\frac{14}{\cos^2(7x + 1)} - \frac{x^2 - 3x}{x\sqrt{x}} - \frac{1}{\sqrt{9 - x^2}} \right) dx$
15	$\int \left(\frac{5x - 3x^6}{x^3} + 4\sin(2x - 3) + \frac{1}{4x^2 + 9} \right) dx$
16	$\int \left(\frac{9^x - 6^x}{3^x} - \frac{3}{6x + 2} + \frac{1}{4 - x^2} \right) dx$
17	$\int \left(4^{3x} - \frac{8}{\sqrt{16x^2 - 9}} + \frac{6}{\sin^2(3x + 2)} \right) dx$
18	$\int \left(9\sqrt[4]{x^3} + 4\cos(2x - 1) - \frac{2}{x^2 + 16} \right) dx$
19	$\int \left(\frac{3x^2\sqrt{x} - 1}{4\sqrt{x}} + 6 \cdot 2^{3x} - \frac{9}{3x - 4} \right) dx$
20	$\int \left(\frac{5x^9 - 2}{\sqrt{x}} - 2\sin\left(\frac{x}{7} + 1\right) + \frac{3}{\sqrt{x^2 - 4}} \right) dx$
21	$\int \left(\frac{4}{\sqrt{9x^2 + 4}} + 3\sin(2x - 4) + \frac{2^x + 3^x}{6^x} \right) dx$

22	$\int \left(\frac{2\sqrt[5]{x^2} + x^3}{x^2} - \frac{3}{9x^2+1} + \frac{5}{\sin^2(3x-4)} \right) dx$
23	$\int \left(\sqrt[3]{8x^7} + \frac{4}{2x-1} - \frac{8}{16x^2-9} \right) dx$
24	$\int \left(\frac{4x^5 + 3x^2\sqrt[3]{x}}{x} + 3 \cdot 5^{2x+3} - \frac{4}{\sqrt{4-9x^2}} \right) dx$
25	$\int \left(3\sqrt[4]{x^3} - \frac{1}{\cos^2(2x-7)} + \frac{6}{4x^2+25} \right) dx$
26	$\int \left(2 \cdot e^{x/5} - 3\sqrt{6x-2} + \frac{x^3 - x\sqrt[6]{x}}{x} \right) dx$
27	$\int \left(\frac{1}{\sqrt{2x+3}} + \frac{6}{4-9x^2} + \frac{5}{e^{3x-4}} \right) dx$
28	$\int \left(6\sqrt[7]{x^3} + \frac{2}{\cos^2(x/7)} - \frac{5}{\sqrt{1-4x^2}} \right) dx$
29	$\int \left(\frac{9x^3}{\sqrt{x}} - 3\sin(3x+7) + \frac{4}{16x^2+9} \right) dx$
30	$\int \left(4x\sqrt[3]{x} - \frac{3}{\cos^2(6x-1)} + \frac{1}{\sqrt{16+x^2}} \right) dx$
31	$\int \left(\frac{4}{\sqrt{4+9x^2}} - \frac{2}{\sin^2 2x - 5} - \frac{x^5 - \sqrt[7]{x^4} + 3x^3}{x^4} \right) dx$
32	$\int \left(\frac{3}{16-25x^2} + 2\cos\frac{x-1}{3} - 4\frac{5^x - 2^x}{10^x} \right) dx$

Задача 4.2. Вычислить неопределенный интеграл.

№	$\int f(x)\,dx$
1	$\int \frac{3\,\mathrm{tg}^2 x + 7\sin x - 5}{\cos^2 x}\,dx$
2	$\int \frac{\arcsin x + 2x - 4}{\sqrt{1-x^2}}dx$
3	$\int \frac{5 + \mathrm{arctg}^2 x - 4x}{1+x^2}dx$
4	$\int \frac{3 - 2x + \arccos x}{\sqrt{1-x^2}}dx$
5	$\int \frac{5\,\mathrm{ctg}^4 x - 2\cos x + 8}{\sin^2 x}dx$
6	$\int \frac{4 + 3x^2\sqrt{x} - 2\ln x}{x}dx$
7	$\int e^x \left(\frac{3}{e^{2x}+1} - 5 + \cos\left(e^x\right)\right)dx$
8	$\int \frac{5 - x^2 + e^{\sqrt{x}} - 4\sin\left(\sqrt{x}\right)}{\sqrt{x}}dx$
9	$\int \frac{6x^7 - 2\cos\left(1/x\right) + 4}{x^2}dx$
10	$\int \frac{7\,\mathrm{arctg}\, x + 3x - 4}{x^2+1}dx$

11	$\int \frac{5 - x + 4\arccos x}{\sqrt{1 - x^2}} dx$
12	$\int \frac{\operatorname{ctg} 2x + 1 - \cos 2x}{\sin^2 2x} dx$
13	$\int \frac{\ln^2 x + 3 - 5\sqrt{\ln x}}{x\sqrt{\ln x}} dx$
14	$\int \frac{4\operatorname{arctg}^3 x + 6x - 1}{1 + x^2} dx$
15	$\int \frac{3x - 7 + 2\arcsin^2 x}{\sqrt{1 - x^2}} dx$
16	$\int \frac{5 - 3\sqrt{\operatorname{tg} x} + \sin x}{\cos^2 x} dx$
17	$\int \left(\frac{2}{\sqrt{e^{2x} - 4}} - \frac{1}{\cos^2 (e^x)} + 4 \right) e^x dx$
18	$\int \frac{7x^2 + 3x^5\sqrt{x} - 2\ln^3 x}{x} dx$
19	$\int \frac{4\operatorname{ctg}^3 3x - 6 + \cos 3x}{\sin^2 3x} dx$
20	$\int \frac{x\sqrt{x} - 3x^6 + 3^{\sqrt{x}} - 2\operatorname{tg}(\sqrt{x})}{\sqrt{x}} dx$
21	$\int \frac{2x - 5^{(1/x)} - 2}{x^2} dx$

22	$\int \frac{3\ln^3 x + 3\sqrt[3]{x} - 2}{x} dx$
23	$\int \frac{2^{\operatorname{tg} x} - 3\sin x + 4}{\cos^2 x} dx$
24	$\int \frac{\sqrt{x^3} + 4x^4 - 2\sin(\sqrt{x})}{\sqrt{x}} dx$
25	$\int \sin x \left(e^{\cos x} + 1 + \frac{5}{\cos^2 x} \right) dx$
26	$\int e^x \left(\frac{3}{e^x + 1} - e^{-3x} + 2 \right) dx$
27	$\int \frac{3x + 2\sqrt[3]{arctg^2 x} - 7}{1 + x^2} dx$
28	$\int \frac{\sin(1/x) + 4\sqrt[3]{x} - 6x^2}{x^2} dx$
29	$\int \frac{e^{\arcsin x} - 3x + 8}{\sqrt{1 - x^2}} dx$
30	$\int \frac{5x^4\sqrt{x} - 3x^3 + 2^{1/x^3}}{x^4} dx$
31	$\int \frac{3x - 5}{\sqrt{1 - x^2}} + \frac{4}{\sqrt{\arccos x \cdot (1 - x^2)}} dx$
32	$\int \frac{5x^2 - 2\sin(1/x^2) - 3x^9 + 4^{1/x^2}}{x^3} dx$

Задача 4.3. Вычислить неопределенный интеграл.

№	$\int f(x)\,dx$	№	$\int f(x)\,dx$
1	$\int \frac{x+1}{x-2}\,dx$	17	$\int \frac{3-x}{x+2}dx$
2	$\int \frac{x^2}{x^2-9}dx$	18	$\int \frac{2x^2+2}{x^2+9}dx$
3	$\int \frac{2x}{x+4}dx$	19	$\int \frac{4x}{x-5}dx$
4	$\int \frac{4x^2}{x^2+4}dx$	20	$\int \frac{9x^2}{x^2-16}dx$
5	$\int \frac{x+4}{x-4}dx$	21	$\int \frac{2x+5}{x-1}dx$
6	$\int \frac{x^2+1}{x^2-1}dx$	22	$\int \frac{x^2-9}{x^2+9}dx$
7	$\int \frac{7x}{x+7}dx$	23	$\int \frac{6x}{x+3}dx$
8	$\int \frac{3x^2}{9+x^2}dx$	24	$\int \frac{8x^2}{x^2+16}dx$
9	$\int \frac{4x}{x+5}dx$	25	$\int \frac{x-8}{x-10}dx$
10	$\int \frac{7x^2}{x^2-9}dx$	26	$\int \frac{5x^2}{9x^2-1}dx$

11	$\int \frac{5x}{x-10}dx$	27	$\int \frac{x}{x+6}dx$
12	$\int \frac{3x^2}{x^2-4}dx$	28	$\int \frac{5x^2}{x^2+9}dx$
13	$\int \frac{2x-3}{x+4}dx$	29	$\int \frac{3x-2}{x-2}dx$
14	$\int \frac{x^2+10}{x^2+25}dx$	30	$\int \frac{x^2+1}{x^2+4}dx$
15	$\int \frac{1-4x}{x+5}dx$	31	$\int \frac{2-6x}{x-5}dx$
16	$\int \frac{x^2+1}{x^2-36}dx$	32	$\int \frac{x^2}{x^2-25}dx$

Задача 4.4. Вычислить неопределенный интеграл.

№	$\int f(x)\,dx$	№	$\int f(x)\,dx$
1	$\int \frac{5x+7}{x^2+x-2}\,dx$	17	$\int \frac{6x+8}{x^2+5x-6}dx$
2	$\int \frac{6}{(2x+1)(x-1)}dx$	18	$\int \frac{29-3x}{x^2-3x-10}dx$
3	$\int \frac{7x+1}{x^2+x-6}dx$	19	$\int \frac{x-4}{x^2-4x-12}dx$
4	$\int \frac{5}{(2x-1)(x+2)}dx$	20	$\int \frac{x-13}{x^2+4x-21}dx$

5	$\int \frac{3x+19}{x^2+x-12}dx$	21	$\int \frac{5x-31}{x^2-12x+35}dx$
6	$\int \frac{4}{(3x+1)(x-1)}dx$	22	$\int \frac{6}{(2x+5)(x-4)}dx$
7	$\int \frac{x+7}{x^2-x-2}dx$	23	$\int \frac{x-5}{x^2-5x+6}dx$
8	$\int \frac{5}{(x+1)(3x-2)}dx$	24	$\int \frac{4}{(3x+1)(x-3)}dx$
9	$\int \frac{x+23}{x^2+x-20}dx$	25	$\int \frac{3x-12}{x^2+2x-8}dx$
10	$\int \frac{11}{(x-4)(2x+3)}dx$	26	$\int \frac{7x-7}{x^2-3x-10}dx$
11	$\int \frac{4x-3}{x^2+x-6}dx$	27	$\int \frac{x+7}{x^2+5x+4}dx$
12	$\int \frac{x+17}{x^2-x-12}dx$	28	$\int \frac{1}{(x+3)(3x-1)}dx$
13	$\int \frac{3x-1}{x^2+3x-10}dx$	29	$\int \frac{3-3x}{x^2+x+20}dx$
14	$\int \frac{6}{(x-4)(2x-3)}dx$	30	$\int \frac{x+23}{x^2+4x-5}dx$
15	$\int \frac{x+7}{x^2+8x+15}dx$	31	$\int \frac{2x+6}{x^2-6x+5}dx$
16	$\int \frac{6-x}{x^2-7x+12}dx$	32	$\int \frac{9}{(x+5)(3x+2)}dx$

Задача 4.5. Вычислить неопределенный интеграл.

№	$\int f(x)\,dx$	№	$\int f(x)\,dx$
1	$\int \frac{5x+1}{x^2(x-2)}\,dx$	17	$\int \frac{x+15}{(x-1)(x+3)^2}dx$
2	$\int \frac{x+1}{(x^2+1)(x-6)}dx$	18	$\int \frac{2x+9}{(x^2+9)(x-1)}dx$
3	$\int \frac{2x-3}{(x+1)^2(x-2)}dx$	19	$\int \frac{x-9}{x(x-3)^2}dx$
4	$\int \frac{2x+3}{(x^2+4)(x-1)}dx$	20	$\int \frac{3x+7}{(x^2+9)(x+1)}dx$
5	$\int \frac{5}{x(x-1)^2}dx$	21	$\int \frac{2x+3}{(x-1)(x+2)^2}dx$
6	$\int \frac{3x-1}{(x^2+1)(x-2)}dx$	22	$\int \frac{3x+1}{(x^2+1)(x-1)}dx$
7	$\int \frac{x^2+7x+8}{x(x+2)^2}dx$	23	$\int \frac{7x-4}{(x-1)^2(x+2)}dx$
8	$\int \frac{4x+5}{(x^2+4)(x+1)}dx$	24	$\int \frac{2x+9}{(x^2+4)(x-2)}dx$
9	$\int \frac{7x-13}{(x+1)(x-2)^2}dx$	25	$\int \frac{x+3}{(x+1)^2(x-3)}dx$
10	$\int \frac{3x+7}{(x^2+4)(x-1)}dx$	26	$\int \frac{7}{(x^2+4)(x+2)}dx$

11	$\int \frac{3x^2+4x+5}{(x-2)(x+3)^2}dx$	27	$\int \frac{2x+5}{(x-4)^2(x+1)}dx$
12	$\int \frac{3x-2}{x(x^2+16)}dx$	28	$\int \frac{7}{(x^2+9)(x-4)}dx$
13	$\int \frac{2x+1}{(x+5)(x-3)^2}dx$	29	$\int \frac{4x}{(x+7)^2(x-1)}dx$
14	$\int \frac{3x-5}{(x^2+9)(x+4)}dx$	30	$\int \frac{6}{(x^2+16)(x-5)}dx$
15	$\int \frac{2x+7}{(x-5)^2(x-1)}dx$	31	$\int \frac{3x+9}{x(x-5)^2}dx$
16	$\int \frac{x-4}{x(x^2+16)}dx$	32	$\int \frac{7}{(x^2+4)(x+6)}dx$

Задача 4.6. Вычислить неопределенный интеграл.

№	$\int f(x)\,dx$	№	$\int f(x)\,dx$
1	$\int \frac{x+1}{x^2+10x+29}\,dx$	17	$\int \frac{x-4}{x^2-4x+29}dx$
2	$\int \frac{x+2}{\sqrt{x^2-8x+20}}dx$	18	$\int \frac{x+3}{\sqrt{x^2-6x+34}}dx$
3	$\int \frac{x-2}{x^2+6x+18}dx$	19	$\int \frac{x+1}{x^2+8x+25}dx$
4	$\int \frac{x+1}{\sqrt{x^2-4x+13}}dx$	20	$\int \frac{x+4}{\sqrt{x^2-10x+41}}dx$

5	$\int \frac{x-3}{x^2+2x+17}dx$	21	$\int \frac{x-2}{x^2-6x+18}dx$
6	$\int \frac{x+2}{\sqrt{x^2-12x+37}}dx$	22	$\int \frac{x+3}{\sqrt{x^2-14x+53}}dx$
7	$\int \frac{x-1}{x^2+4x+13}dx$	23	$\int \frac{x-3}{x^2+10x+34}dx$
8	$\int \frac{x-2}{\sqrt{x^2+14x+48}}dx$	24	$\int \frac{x-6}{\sqrt{x^2+4x+68}}dx$
9	$\int \frac{x+2}{x^2-6x+10}dx$	25	$\int \frac{x-1}{x^2-8x+65}dx$
10	$\int \frac{x+3}{\sqrt{x^2-10x+24}}dx$	26	$\int \frac{x-5}{\sqrt{x^2-2x+17}}dx$
11	$\int \frac{3x+1}{x^2-4x+20}dx$	27	$\int \frac{5x-2}{x^2+8x+20}dx$
12	$\int \frac{x+5}{\sqrt{x^2-6x+25}}dx$	28	$\int \frac{x+3}{\sqrt{x^2-8x+32}}dx$
13	$\int \frac{2x-3}{x^2+14x+58}dx$	29	$\int \frac{x}{x^2-10x+29}dx$
14	$\int \frac{2x+6}{\sqrt{x^2+4x+53}}dx$	30	$\int \frac{x-7}{\sqrt{x^2-6x+34}}dx$
15	$\int \frac{2x+4}{x^2-8x+25}dx$	31	$\int \frac{3x-1}{x^2+10x+34}dx$
16	$\int \frac{2x+3}{\sqrt{x^2-2x+50}}dx$	32	$\int \frac{7x+1}{\sqrt{x^2-6x+48}}dx$

Задача 4.7. Вычислить неопределенный интеграл.

№	$\int f(x)\,dx$	№	$\int f(x)\,dx$
1	$\int (x+5)\cos 3x\,dx$	17	$\int (x+6)\,e^{7x}dx$
2	$\int \sin(2x+1)\cdot x dx$	18	$\int (5x+2)\cdot 2^{3x}dx$
3	$\int e^{2x+3}\cdot x dx$	19	$\int (6x-3)\,\cos 2x dx$
4	$\int (x+2)\cdot 3^{2x}dx$	20	$\int (4x+1)\,\sin 2x dx$
5	$\int (3x-1)\,\cos 4x dx$	21	$\int e^{3x}\cdot(5x+2)dx$
6	$\int (x+2)\,\sin 6x dx$	22	$\int 4^{x}\cdot(3x-2)dx$
7	$\int (4x+1)e^{2x}dx$	23	$\int \cos 5x\cdot(x+7)dx$
8	$\int (2x+1)4^{x}dx$	24	$\int (2x+1)\,\sin 7x dx$
9	$\int (x-4)\,\cos 5x dx$	25	$\int (x-3)e^{5x}dx$
10	$\int (3x+2)\,\sin x dx$	26	$\int 4^{3x-2}\cdot x dx$

11	$\int e^{3x-4} \cdot x dx$	27	$\int (2x+3)\ \sin 4x dx$
12	$\int 5x \cdot 2^{3x+1} dx$	28	$\int (4x-1)\ \cos 3x dx$
13	$\int (2x+5)\ \cos 2x dx$	29	$\int e^{x/2} \cdot (4x-7) dx$
14	$\int (9x-10)\ \sin (x/3) dx$	30	$\int e^{x} \cdot (3x+2) dx$
15	$\int (2x+8) e^{x-5} dx$	31	$\int \cos 7x \cdot (2x-6) dx$
16	$\int (2x-6)\ \sin 4x dx$	32	$\int (3x-4) 5^{x/3} dx$

Задача 4.8. Вычислить неопределенный интеграл.

№	$\int f(x)\, dx$	№	$\int f(x)\, dx$
1	$\int \operatorname{arctg} 2x dx$	17	$\int \arcsin (2x-3) dx$
2	$\int x^2 \ln x dx$	18	$\int (x+3) \ln x dx$
3	$\int \arcsin (3x+1) dx$	19	$\int \arccos 3x dx$
4	$\int \sqrt{x} \ln x dx$	20	$\int \ln (2x+1) dx$

5	$\int \arccos 4x dx$	21	$\int x \cdot \operatorname{arctg} x dx$
6	$\int \frac{\ln x}{x^2} dx$	22	$\int \operatorname{arcctg}(4x-1) dx$
7	$\int \operatorname{arcctg} \frac{x}{2} dx$	23	$\int x \ln 5x dx$
8	$\int \frac{\ln x}{\sqrt{x}} dx$	24	$\int \arccos(x/5) dx$
9	$\int \operatorname{arctg} 3x dx$	25	$\int x^3 \cdot \ln x dx$
10	$\int \ln(x^2+1) dx$	26	$\int \operatorname{arctg}(x/3) dx$
11	$\int \frac{\ln x}{x^3} dx$	27	$\int \frac{\ln x}{x-3} dx$
12	$\int \operatorname{arctg}(2x-4) dx$	28	$\int \operatorname{arcctg}(x+2) dx$
13	$\int \ln(3x+2) dx$	29	$\int \frac{\ln x}{\sqrt[3]{x}} dx$
14	$\int \arccos(3x+5) dx$	30	$\int \arcsin(3x-5) dx$
15	$\int \frac{\ln x}{2x+1} dx$	31	$\int (x+1) \cdot \operatorname{arctg} x dx$
16	$\int \operatorname{arcctg} \frac{x}{7} dx$	32	$\int \frac{\ln x}{(x-1)^2} dx$

Задача 4.9. Вычислить неопределенный интеграл.

№	$\int f(x)\,dx$	№	$\int f(x)\,dx$
1	$\int \sin^2 3x dx$	17	$\int \cos^2 3x dx$
2	$\int \mathrm{tg}^2\, 2x dx$	18	$\int \sin^2 4x dx$
3	$\int \cos^3 4x dx$	19	$\int \mathrm{tg}^2\, 3x dx$
4	$\int \sin 2x \cos 3x dx$	20	$\int \cos^3 5x dx$
5	$\int \sin^2 x \cos^3 x dx$	21	$\int \sin 4x \sin 5x dx$
6	$\int \dfrac{\cos^3 x}{\sin^2 x} dx$	22	$\int \sin^3 x \cos^2 x dx$
7	$\int \dfrac{\sin^3 x}{\cos^7 x} dx$	23	$\int \dfrac{\sin^3 x}{\cos^2 x} dx$
8	$\int \sin 2x \cos 6x dx$	24	$\int \mathrm{tg}^3\, 2x dx$
9	$\int \dfrac{\sin^3 x}{\sqrt{\cos x}} dx$	25	$\int \cos^2 7x dx$
10	$\int \mathrm{tg}^3\, x dx$	26	$\int \sqrt{\sin x} \cos^3 x dx$
11	$\int \mathrm{ctg}^2\, 3x dx$	27	$\int \cos^5 x dx$
12	$\int \cos^2 5x dx$	28	$\int \mathrm{ctg}^3\, x dx$
13	$\int \sin 7x \cos 8x dx$	29	$\int \sin^3 5x dx$
14	$\int \sin^2 7x dx$	30	$\int \cos^3 4x dx$

15	$\int \frac{\sin^3 2x}{\cos^2 2x} dx$	31	$\int \frac{\cos^3 x}{\sqrt[3]{\sin^2 x}} dx$
16	$\int \operatorname{ctg}^2 3x dx$	32	$\int \cos^4 x dx$

Задача 4.10. Вычислить неопределенный интеграл, используя тригонометрические подстановки.

№	$\int f(x)\,dx$	№	$\int f(x)\,dx$
1	$\int \sqrt{9-x^2}\,dx$	17	$\int \frac{x^2}{\sqrt{4-x^2}} dx$
2	$\int \frac{\sqrt{x^2-4}}{x^3} dx$	18	$\int \frac{dx}{(x^2-9)\sqrt{x^2-9}}$
3	$\int \frac{x^5}{\sqrt{16-x^2}} dx$	19	$\int x^3\sqrt{49-x^2}\,dx$
4	$\int \frac{dx}{(25+x^2)\sqrt{25+x^2}}$	20	$\int \frac{\sqrt{x^2-64}}{x^4} dx$
5	$\int \frac{x^2}{\sqrt{9-x^2}} dx$	21	$\int \frac{x^2}{\sqrt{25-x^2}} dx$
6	$\int \frac{dx}{\sqrt{(x^2-4)^3}}$	22	$\int \frac{dx}{(16+x^2)\sqrt{16+x^2}}$
7	$\int \frac{x^5}{\sqrt{9-x^2}} dx$	23	$\int \frac{x^5}{\sqrt{4-x^2}} dx$
8	$\int \frac{\sqrt{x^2-9}}{x^4} dx$	24	$\int \frac{\sqrt{x^2-25}}{x^3} dx$
9	$\int \frac{dx}{\sqrt{(x^2-49)^3}}$	25	$\int \sqrt{49-x^2}\,dx$
10	$\int \frac{dx}{\sqrt{(x^2+16)^3}}$	26	$\int \frac{x^2}{\sqrt{64-x^2}} dx$

11	$\int \frac{x^3}{\sqrt{4-x^2}}dx$	27	$\int x^3\sqrt{16-x^2}dx$
12	$\int \frac{dx}{\sqrt{(x^2-64)^3}}$	28	$\int \frac{dx}{(16-x^2)\sqrt{16-x^2}}$
13	$\int \frac{\sqrt{4-x^2}}{x^2}dx$	29	$\int \frac{\sqrt{16-x^2}}{x}dx$
14	$\int x^3\sqrt{9-x^2}dx$	30	$\int x^3\sqrt{25-x^2}dx$
15	$\int \frac{dx}{\sqrt{(4-x^2)^3}}$	31	$\int \frac{\sqrt{49-x^2}}{x^4}\,dx$
16	$\int \frac{dx}{\sqrt{(x^2-16)^3}}$	32	$\int \frac{dx}{\sqrt{(25+x^2)^3}}$

Задача 4.11. Вычислить неопределенный интеграл, используя универсальную тригонометрическую подстановку.

№	$\int f(x)\,dx$	№	$\int f(x)\,dx$
1	$\int \frac{1}{1+4\sin x}dx$	17	$\int \frac{1}{5-2\sin x+4\cos x}dx$
2	$\int \frac{1}{8-4\sin x+7\cos x}dx$	18	$\int \frac{1}{1+\cos^2 x}dx$
3	$\int \frac{1}{\sin^3 x}dx$	19	$\int \frac{1}{\cos 2x-\sin 2x}dx$
4	$\int \frac{1}{2+3\cos x}dx$	20	$\int \frac{1}{4\sin x+3\cos x+5}dx$
5	$\int \frac{1}{2\sin x+3\cos x+5}dx$	21	$\int \frac{1}{5+3\cos x}dx$
6	$\int \frac{1}{1+\sin^2 x}dx$	22	$\int \frac{2}{3-2\sin x+4\cos x}dx$

7	$\int \frac{3}{5-3\cos x}dx$	23	$\int \frac{5}{1-\sin x}dx$
8	$\int \frac{1}{4+2\sin x+3\cos x}dx$	24	$\int \frac{3}{4+4\sin x+5\cos x}dx$
9	$\int \frac{1}{\sin x(1+\cos x)}dx$	25	$\int \frac{2}{2\sin x-\cos x-1}dx$
10	$\int \frac{1}{1-3\sin x}dx$	26	$\int \frac{3}{4\cos x-3\sin x-5}dx$
11	$\int \frac{3}{5-3\sin x+2\cos x}dx$	27	$\int \frac{\sin x}{1+\sin x}dx$
12	$\int \frac{4}{\cos x+\sin x}dx$	28	$\int \frac{26}{5+2\sin x+3\cos x}dx$
13	$\int \frac{2}{1-\sin x+2\cos x}dx$	29	$\int \frac{7}{4\cos x-1}dx$
14	$\int \frac{6}{1+5\sin^2 x}dx$	30	$\int \frac{1}{3-2\sin x+2\cos x}dx$
15	$\int \frac{3}{3\sin x+2\cos x}dx$	31	$\int \frac{4\sin x}{\sin x+\cos x}dx$
16	$\int \frac{3}{4-5\sin x-3\cos x}dx$	32	$\int \frac{11}{6+4\cos x+3\sin x}dx$

Задача 4.12. Вычислить определенный интеграл.

№	$\int_a^b f(x)\,dx$	№	$\int_a^b f(x)\,dx$
1	$\int_0^1 x\cdot e^{-x}\,dx$	17	$\int_1^e \frac{\ln^2 x}{x}dx$
2	$\int_0^{\pi/2} x\sin x dx$	18	$\int_0^1 \arcsin x dx$

3	$\int\limits_{\pi/4}^{\pi/3} \frac{x}{\sin^2 x} dx$	19	$\int\limits_{\pi/6}^{\pi/4} x \cos 2x dx$
4	$\int\limits_{0}^{\pi} x^2 \sin x dx$	20	$\int\limits_{1}^{\sqrt[3]{e}} x^2 \ln x dx$
5	$\int\limits_{1}^{2} x \ln x dx$	21	$\int\limits_{0}^{1/2} e^{2x} x dx$
6	$\int\limits_{0}^{e} \ln(x+1) dx$	22	$\int\limits_{\pi/6}^{\pi/3} 2x \cdot \cos 3x dx$
7	$\int\limits_{-1/3}^{1/3} e^{-3x} \cdot x\, dx$	23	$\int\limits_{1}^{4} \frac{\ln x}{\sqrt{x}} dx$
8	$\int\limits_{0}^{2} \frac{x^2}{e^{2x}} dx$	24	$\int\limits_{-1}^{1} \arccos x dx$
9	$\int\limits_{0}^{\pi/4} \operatorname{arctg} x dx$	25	$\int\limits_{0}^{1} x \cdot 2^x dx$
10	$\int\limits_{4}^{9} \frac{\sqrt{x}}{\sqrt{x}-1} dx$	26	$\int\limits_{\ln 2}^{\ln 5} \frac{e^x}{(e^x+1)} dx$
11	$\int\limits_{1}^{e} \ln^2 x dx$	27	$\int\limits_{0}^{1/2} \arccos 2x dx$
12	$\int\limits_{0}^{\pi/2} \sin 3x \cdot \cos 5x dx$	28	$\int\limits_{0}^{1} e^x \cdot (x+1) dx$

13	$\int\limits_1^e \frac{\ln x}{x}dx$	29	$\int\limits_0^{2\pi} \cos^2 4x dx$
14	$\int\limits_0^1 \frac{e^x}{\sqrt{e^{2x}+1}}dx$	30	$\int\limits_{-2}^2 \frac{x^2}{x^2+4}dx$
15	$\int\limits_0^{\pi/4} \sin^3 x dx$	31	$\int\limits_e^{e^2} \frac{1}{x\ln x}dx$
16	$\int\limits_0^1 \frac{x^3}{x^4+1}dx$	32	$\int\limits_{\pi/4}^{\pi/2} \frac{x}{\sin^2 x}dx$

Задача 4.13. Вычислить определенный интеграл.

№	$\int\limits_a^b f(x)\,dx$	№	$\int\limits_a^b f(x)\,dx$
1	$\int\limits_{-\pi/2}^{\pi/2} \frac{dx}{1+\cos x}$	17	$\int\limits_0^{\pi/2} \frac{\sin x}{1+\cos x}dx$
2	$\int\limits_{-3}^{-2} \frac{dx}{x^2+4x+5}$	18	$\int\limits_0^{\pi/2} x\sin x dx$
3	$\int\limits_0^{\pi/2} \cos^5 x \sin 2x dx$	19	$\int\limits_{-3}^{-2} \frac{3\,dx}{x^2-8x+16}$
4	$\int\limits_{-2}^{-1} \frac{dx}{(10+3x)^3}$	20	$\int\limits_0^{\pi/2} \frac{dx}{1+\sin x}$

5	$\int\limits_1^e \frac{dx}{x\sqrt{1-(\ln x)^2}}$	21	$\int\limits_0^{\pi/4} \frac{x}{\cos^2 x}dx$
6	$\int\limits_1^e \frac{1+\ln x}{x}dx$	22	$\int\limits_1^2 \frac{dx}{\sqrt{x^2-4x+8}}$
7	$\int\limits_1^2 \frac{e^{1/x}}{x^2}\,dx$	23	$\int\limits_{\pi/4}^{\pi/2} \cos^2 x dx$
8	$\int\limits_0^2 \frac{x}{1+x^4}dx$	24	$\int\limits_{-3}^{-1} \frac{dx}{x^2+6x+13}$
9	$\int\limits_0^1 \frac{e^x}{1+e^{2x}}dx$	25	$\int\limits_{\pi/4}^{\pi/3} \frac{\sin x}{\cos^2 x}dx$
10	$\int\limits_3^4 \frac{3}{(2-x)^2}dx$	26	$\int\limits_0^1 \frac{\sqrt{x}}{1+x}dx$
11	$\int\limits_0^{1/2} \frac{\arcsin^2 x}{\sqrt{1-x^2}}dx$	27	$\int\limits_{-1/2}^0 \frac{\arccos x}{\sqrt{1-x^2}}$
12	$\int\limits_1^2 \frac{4dx}{(x+1)(x-3)}$	28	$\int\limits_0^{\pi/2} \frac{\sin x dx}{1+\cos^2 x}$
13	$\int\limits_1^e \frac{dx}{x\sqrt{1-(\ln x)^2}}$	29	$\int\limits_0^{\pi/12} \sin 4x \sin^2 x dx$
14	$\int\limits_0^1 4^x \cdot x dx$	30	$\int\limits_0^{\pi/2} (x-1)\cdot \cos 2x dx$

15	$\int\limits_0^2 \frac{x^4}{1+x^4}dx$	31	$\int\limits_0^{\pi/4} \frac{dx}{\cos x}$
16	$\int\limits_1^2 \frac{dx}{x^2-4x+5}$	32	$\int\limits_0^4 \frac{3x-9}{x^2-4x-5}dx$

Задача 4.14. Вычислить несобственный интеграл или установить, что он расходится.

№	$\int\limits_a^b f(x)\,dx$	№	$\int\limits_a^b f(x)\,dx$
1	$\int\limits_{-\infty}^{+\infty} \frac{dx}{x^2+9}$	17	$\int\limits_1^{+\infty} \frac{dx}{x(1+\ln^2 x)}$
2	$\int\limits_0^{+\infty} x\cdot e^{-3x}dx$	18	$\int\limits_0^1 \frac{\cos\sqrt{x}}{\sqrt{x}}dx$
3	$\int\limits_2^{+\infty} \frac{dx}{x\ln^2 x}$	19	$\int\limits_1^{+\infty} \frac{dx}{(1+x^2)\operatorname{arctg}^2 x}$
4	$\int\limits_1^e \frac{dx}{x\sqrt{\ln x}}$	20	$\int\limits_0^{+\infty} \frac{e^x dx}{1+e^{2x}}$
5	$\int\limits_0^1 \frac{dx}{\sqrt{x}\sqrt{1-x}}$	21	$\int\limits_2^{+\infty} \frac{xdx}{x^2-1}$
6	$\int\limits_0^{+\infty} \frac{dx}{1+4x^2}$	22	$\int\limits_0^2 \frac{xdx}{\sqrt{1-x^4}}$

7	$\int\limits_0^{+\infty} x \cdot e^{-x^2} dx$	23	$\int\limits_1^{+\infty} \frac{e^{1/x}}{x^2} dx$
8	$\int\limits_0^{1} \frac{x dx}{\sqrt{1-x^2}}$	24	$\int\limits_1^{+\infty} \frac{e^{-\sqrt{x}}}{\sqrt{x}} dx$
9	$\int\limits_{-\infty}^{+\infty} \frac{dx}{x^2+2x+2}$	25	$\int\limits_1^{+\infty} \frac{x^3+1}{x^4} dx$
10	$\int\limits_1^{+\infty} \frac{3dx}{x^2-x-2}$	26	$\int\limits_{-\infty}^{+\infty} \frac{\operatorname{arctg}^3 x}{x^2+1} dx$
11	$\int\limits_3^{+\infty} \frac{x dx}{4-x^2}$	27	$\int\limits_{-\infty}^{0} \frac{dx}{x^2-6x+10}$
12	$\int\limits_0^{+\infty} \frac{x+2}{e^x} dx$	28	$\int\limits_0^{1} \frac{\ln^3 x}{x} dx$
13	$\int\limits_0^{+\infty} \frac{\sqrt{\operatorname{arctg} x}}{1+x^2} dx$	29	$\int\limits_1^{+\infty} \frac{dx}{x(1+\ln x)}$
14	$\int\limits_0^{1} \ln x$	30	$\int\limits_1^{+\infty} \frac{\sqrt[3]{x}+5}{x^3} dx$
15	$\int\limits_5^{+\infty} \frac{3dx}{x^2+3x-4}$	31	$\int\limits_0^{+\infty} \frac{x+1}{e^x} dx$
16	$\int\limits_1^{+\infty} \frac{x^2}{1+x^6} dx$	32	$\int\limits_0^{1} \frac{x^3}{1-x^8} dx$