

Indefinite integral

Evaluate:

1. $\int (x^2 + 3x - 5) dx$ $\left(\frac{x^3}{3} + \frac{3x^2}{2} - 5x + c \right)$
2. $\int \frac{x^2 + \sqrt{x} + 2}{x} dx$ $\left(\frac{x^2}{2} + 2\sqrt{x} + 2\ln|x| + c \right)$
3. $\int (2 \sin x + 3 \cos x) dx$ $(-2 \cos x + 3 \sin x + c)$
4. $\int e^x 2^x dx$ $\left(\frac{e^x 2^x}{1 + \ln 2} + c \right)$
5. $\int tg^2 x dx$ $(tg x - x + c)$
6. $\int \frac{x^2}{x^2 + 1} dx$ $(x - \arctg x + c)$
7. $\int \frac{1}{2x + 1} dx$ $\left(\frac{1}{2} \ln|2x + 1| + c \right)$
8. $\int \frac{3x}{x^2 + 4} dx$ $\left(\frac{3}{2} \ln(x^2 + 4) + c \right)$
9. $\int \cot g x dx$ $(\ln|\sin x| + c)$
10. $\int \frac{1}{x \ln x} dx$ $(\ln|\ln x| + c)$
11. $\int \frac{1}{\sqrt{1 - x^2} \arcsin x} dx$ $(\ln|\arcsin x| + c)$

Per Partes method

1. $\int x \cdot \cos x dx$ $(x \sin x + \cos x + c)$
2. $\int x 2^x dx$ $\left(\frac{x 2^x}{\ln 2} - \frac{2^x}{\ln^2 2} + c \right)$
3. $\int x \frac{1}{\cos^2 x} dx$ $(x \tg x + \ln|\cos x| + c)$
4. $\int 2x^2 e^x dx$ $(2e^x (x^2 - 2x + 2) + c)$
5. $\int x \ln x dx$ $\left(\frac{1}{2} x^2 \ln x - \frac{x^2}{4} + c \right)$
6. $\int \frac{\ln x}{\sqrt{x}} dx$ $(2\sqrt{x} \ln x - 4\sqrt{x} + c)$
7. $\int x \arctg x dx$ $\left(\frac{x^2}{2} \arctg x - \frac{x}{2} + \frac{\arctg x}{2} + c \right)$

8. $\int \ln x \, dx$	$(x \ln x - x + c)$
9. $\int \operatorname{arctg}(2x) \, dx$	$\left(x \operatorname{arctg}(2x) - \frac{1}{4} \ln(1 + 4x^2) + c \right)$
10. $\int \arcsin x \, dx$	$(x \arcsin x + \sqrt{1 - x^2} + c)$
11. $\int \ln(1 + x^2) \, dx$	$(x \ln(1 + x^2) - 2x + 2 \operatorname{arctg} x + c)$

Substitution method

1. $\int (2x + 3)^{10} \, dx$	$\left(\frac{(2x + 3)^{11}}{22} + c \right)$
2. $\int \frac{1}{\sqrt{x - 3}} \, dx$	$(2\sqrt{x - 3} + c)$
3. $\int x\sqrt{x^2 + 4} \, dx$	$\left(\frac{(x^2 + 4)\sqrt{x^2 + 4}}{3} + c \right)$
4. $\int x \sin(x^2 + 5) \, dx$	$\left(-\frac{1}{2} \cos(x^2 + 5) + c \right)$
5. $\int x e^{x^2} \, dx$	$\left(\frac{e^{x^2}}{2} + c \right)$
6. $\int x^2 \sqrt[3]{x^3 - 4} \, dx$	$\left(\frac{(x^3 - 4)^{\frac{4}{3}}}{4} + c \right)$
7. $\int \frac{x^2}{\cos^2(x^3 + 2)} \, dx$	$\left(\frac{\operatorname{tg}(x^3 + 2)}{3} + c \right)$
8. $\int \frac{\sqrt{1 + \operatorname{tg} x}}{\cos^2 x} \, dx$	$\left(\frac{2(\operatorname{tg} x + 1)^{\frac{3}{2}}}{3} + c \right)$
9. $\int \frac{\operatorname{arctg} x}{1 + x^2} \, dx$	$\left(\frac{\operatorname{arctg}^2 x}{2} + c \right)$
10. $\int \frac{1}{\arcsin^3 x \sqrt{1 - x^2}} \, dx$	$\left(-\frac{1}{2 \arcsin^2 x} + c \right)$
11. $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} \, dx$	$(2e^{\sqrt{x}} + c)$
12. $\int \frac{1}{x^2} \cos \frac{1}{x} \, dx$	$\left(-\sin \frac{1}{x} + c \right)$
13. $\int \frac{e^x}{\sqrt{1 - e^{2x}}} \, dx$	$(\arcsin e^x + c)$

Integration of rational functions

1. $\int \frac{1}{(x-2)^2} dx$ $\left(-\frac{1}{x-2} + c \right)$
2. $\int \frac{3}{x^2 + 2x + 1} dx$ $\left(-\frac{3}{x+1} + c \right)$
3. $\int \frac{2x-1}{x^2 - 4x + 4} dx$ $\left(2\ln|x-2| - \frac{3}{x-2} + c \right)$
4. $\int \frac{1}{5+x^2} dx$ $\left(\frac{1}{\sqrt{5}} \operatorname{arctg} \frac{x}{\sqrt{5}} + c \right)$
5. $\int \frac{3}{x^2 + x + 1} dx$ $\left(\frac{10}{\sqrt{3}} \operatorname{arctg} \frac{2x+1}{\sqrt{3}} + c \right)$
6. $\int \frac{3x+2}{x^2 - 2x + 5} dx$ $\left(\frac{5}{2} \ln(x^2 - 2x + 5) + \frac{5}{2} \operatorname{arctg} \frac{x-1}{2} \right)$
7. $\int \frac{1}{x^2 - 4} dx$ $\left(\frac{1}{2} \ln|x-2| - \frac{1}{4} \ln|x+2| + c \right)$
8. $\int \frac{5}{x^2 + x - 6} dx$ $\left(\ln|x-2| - \ln|x+3| + c \right)$
9. $\int \frac{x}{x^2 + 5x + 4} dx$ $\left(\frac{4}{3} \ln|x+4| - \frac{1}{3} \ln|x+1| + c \right)$

Integration of irrational functions

1. $\int \frac{x-1}{\sqrt[3]{x+2}} dx$ $\left(\frac{3}{5} \sqrt[3]{(x+2)^5} - \frac{9}{2} \sqrt[3]{(x+2)^2} + c \right)$
2. $\int \frac{\sqrt{2x+1}}{\sqrt{2x+1}+2} dx$ $\left(\frac{2x+1}{2} - 2\sqrt{2x+1} + 4\ln|\sqrt{2x+1}+2| + c \right)$
3. $\int \frac{\sqrt{x}}{x(\sqrt[3]{x}+\sqrt{x})} dx$ $\left(6\ln|\sqrt[6]{x}+1| + c \right)$
3. $\int \frac{1}{\sqrt{4-x^2}} dx$ $\left(\arcsin \frac{x}{2} + c \right)$
4. $\int \frac{2}{\sqrt{5+2x-x^2}} dx$ $\left(2\arcsin \frac{x-1}{\sqrt{6}} + c \right)$
5. $\int \frac{1}{\sqrt{x^2+5}} dx$ $\left(\ln|x+\sqrt{x^2+5}| + c \right)$
6. $\int \frac{3}{\sqrt{x^2-2}} dx$ $\left(3\ln|x+\sqrt{x^2-2}| + c \right)$
7. $\int \frac{dx}{\sqrt{x^2-4x+11}}$ $\left(\ln|x-2+\sqrt{x^2-4x+11}| + c \right)$
8. $\int \frac{dx}{\sqrt{x^2+6x+5}}$ $\left(\ln|x+3+\sqrt{x^2+6x+5}| + c \right)$

Integration of trigonometric functions

1. $\int \frac{\cos x}{\sin^4 x} dx$ $\left(-\frac{1}{3\sin^3 x} + c \right)$
2. $\int \frac{\cos x}{\sin^2 x - 6\sin x + 11} dx$ $\left(\frac{1}{\sqrt{2}} \operatorname{arctg} \frac{\sin x - 3}{\sqrt{2}} + c \right)$
3. $\int e^{\sin x} \cos x dx$ $(e^{\sin x} + c)$
4. $\int \frac{\sin x}{\sqrt{1 + \cos^2 x}} dx$ $\left(-\ln \left| \cos x + \sqrt{1 + \cos^2 x} \right| + c \right)$
5. $\int \cos^3 x \sin x dx$ $\left(-\frac{\cos^4 x}{4} + c \right)$
6. $\int \cos^3 x dx$ $\left(\frac{\sin^3 x}{3} - \sin x + c \right)$
7. $\int \cos^2 x dx$ $\left(\frac{1}{2}x + \frac{\sin 2x}{4} + c \right)$
8. $\int \sin^2 x dx$ $\left(\frac{1}{2}x - \frac{\sin 2x}{4} + c \right)$