Vypočítajte integrály metódou per partes:

1. $\int x\cos x dx \ \left[x\sin x+\cos x+c\right]$
2. $\int x\mathrm{arctg}x dx \ \left[\frac{x^2}{2}\mathrm{arctg}x-\frac{x}{2}+\frac{1}{2}\mathrm{arctg}x+c\right]$
3. $\int \ln x dx \ \left[x\ln x-x+c\right]$
4. $\int \mathrm{arctg}x dx \ \left[x\mathrm{arctg}x-\frac{1}{2}\ln(1+x^2)+c\right]$
5. $\int \arcsin x dx \ \left[x\arcsin x+\sqrt{1-x^2}+c\right]$
6. $\int x\mathrm{tg}^2 x dx \ \left[x\mathrm{tg}x-\frac{x^2}{2}+\ln|\cos x|+c\right]$
7. $\int \frac{x}{\cos^2 x} dx \ \left[x\mathrm{tg}x+\ln|\cos x|+c\right]$
8. $\int \ln^2 x dx \ \left[x\ln^2 x-2x\ln x+2x+c\right]$
9. $\int (x^2+3)\sin 2x dx \ \left[-\frac{(x^2+3)}{2}\cos 2x+\frac{x}{2}\sin 2x+\frac{1}{4}\cos 2x+c\right]$
10. $\int \ln(x+\sqrt{1+x^2}) dx \ \left[x\ln(x+\sqrt{1+x^2})-\sqrt{1+x^2}+c\right]$
11. $\int \left(\frac{\ln x}{x}\right)^2 dx \ \left[-\frac{\ln^2 x}{x}-\frac{2\ln x}{x}-\frac{2}{x}+c\right]$
12. $\int \frac{\arcsin x}{\sqrt{1+x}} dx \ \left[2\sqrt{1+x}\arcsin x+4\sqrt{1-x}+c\right]$
13. $\int \mathrm{e}^x\cos x dx \ \left[\frac{\mathrm{e}^x}{2}(\sin x+\cos x)+c\right]$
14. $\int \sin(\ln x) dx \ \left[\frac{x}{2}\big(\sin(\ln x)-\cos(\ln x)\big)+c\right]$
15. $\int \cos(\ln x) dx \ \left[\frac{x}{2}\big(\cos(\ln x)+\sin(\ln x)\big)+c\right]$
16. $\int \sin 2x\cos 3x dx \ \left[\frac{1}{5}(3\sin 2x\sin 3x+2\cos 2x\cos 3x)+c=\frac{\cos x}{2}-\frac{\cos 5x}{10}+c\right]$
17. $\int \cos x\cos 3x dx \ \left[\frac{1}{8}(3\cos x\sin 3x-\sin x\cos 3x)+c=\frac{\sin 4x}{8}+\frac{\sin 2x}{4}+c\right]$

Vypočítajte integrály s využitím substitúcie:

1. $\int \frac{x}{1+x^4} dx \ \left[\frac{1}{2}\mathrm{arctg}(x^2)+c\right]$
2. $\int \frac{x^2}{(1-x)^{100}} dx \ \left[\frac{1}{99(1-x)^{99}}-\frac{1}{49(1-x)^{98}}+\frac{1}{97(1-x)^{97}}+c\right]$

3. $\int \frac{1}{1+\cos x}dx \ \left[-\operatorname{cotg}x + \frac{1}{\sin x} + c\right]$

4. $\int \frac{1}{\sqrt{1-2x-x^2}}dx \ \left[\arcsin\left(\frac{1+x}{\sqrt{2}}\right) + c\right]$

5. $\int \frac{7}{2x^2+3x+2}dx \ \left[2\sqrt{7}\operatorname{arctg}\left(\frac{4x+3}{\sqrt{7}}\right) + c\right]$

6. $\int \frac{x}{(3+x^2)^9}dx \ \left[-\frac{1}{16(3+x^2)^8} + c\right]$

7. $\int \sin 4x \sin 2x dx \ \left[\frac{\sin^3 2x}{3} + c = \frac{\sin 2x}{4} - \frac{\sin 6x}{12} + c\right]$

8. $\int \frac{1}{\cos x}dx \ \left[\frac{1}{2}\ln\left|\frac{1+\sin x}{1-\sin x}\right| + c\right]$