

Vypočítajte integrály priamym integrovaním (pomocou integrálov elementárnych funkcií):

1. $\int x(1 + 2x^2)^2 dx \left[\frac{x^2}{2} + x^4 + \frac{2x^6}{3} + c \right]$

2. $\int \sqrt{x^3} - \frac{1}{\sqrt{x}} dx \left[\frac{2}{5}x^{\frac{5}{2}} - 2x^{\frac{1}{2}} + c \right]$

3. $\int e^x a^x dx \left[\frac{e^x a^x}{1 + \ln a} + c \right]$

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

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

6. $\int \frac{1}{\sin^2 x \cos^2 x} dx \left[\operatorname{tg} x - \operatorname{cotg} x + c \right]$

7. $\int \operatorname{tg}^2 x dx \left[\operatorname{tg} x - x + c \right]$

8. $\int \operatorname{cotg}^2 x dx \left[-\operatorname{cotg} x - x + c \right]$

9. $\int \cos^2 x dx \left[\frac{x}{2} + \frac{\sin 2x}{4} + c \right]$

10. $\int \sin^2 x dx \left[\frac{x}{2} - \frac{\sin 2x}{4} + c \right]$

11. $\int \sin^4 x dx \left[\frac{3}{8}x - \frac{\sin 2x}{4} + \frac{\sin 4x}{32} + c \right]$

12. $\int \frac{1+\cos^2 x}{1+\cos 2x} dx \left[\frac{1}{2}(\operatorname{tg} x + x) + c \right]$

13. $\int 2 \sin^2 \frac{x}{2} dx \left[x - \sin x + c \right]$

14. $\int \sin 2x \cos 3x dx \left[\frac{\cos x}{2} - \frac{\cos 5x}{10} + c \right]$

15. $\int \cos x \cos 3x dx \left[\frac{\sin 4x}{8} + \frac{\sin 2x}{4} + c \right]$

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

17. $\int \operatorname{tg} x dx \left[-\ln |\cos x| + c \right]$

18. $\int \operatorname{cotg} x dx \left[\ln |\sin x| + c \right]$

19. $\int \frac{1}{x \ln x} dx \left[\ln |\ln x| + c \right]$

$$20. \int \frac{3x}{1+x^2} dx \left[\frac{3}{2} \ln(1+x^2) + c \right]$$

$$21. \int \frac{1}{\sqrt{1+x}} dx \left[2\sqrt{1+x} + c \right]$$

$$22. \int \frac{1}{\sqrt{1-x}} dx \left[-2\sqrt{1-x} + c \right]$$