$\int 0\,dx = x + c$

$\int k\,dx = kx + c \quad k \in \mathbb{R}$

$\int x^n dx = \frac{x^{n+1}}{n+1} + c \quad n \in \mathbb{R},\ n \neq -1$

$\int \frac{1}{x}\,dx = \ln|x| + c$

$\int k^x dx = k^x + c$

$\int a^x dx = \frac{a^x}{\ln a} + c \quad a > 0,\ a \neq 1,\ a \in \mathbb{R}$

$\int \frac{f'(x)}{f(x)}\,dx = \ln|f(x)| + c \quad c \in \mathbb{R}$

$\int \sin x\,dx = -\cos x + c$

$\int \cos x\,dx = \sin x + c$

$\int \frac{1}{\cos^2 x}\,dx = \operatorname{tg} x + c$

$\int \frac{1}{\sin^2 x}\,dx = -\operatorname{cotg} x + c$

$\int \frac{1}{a^2+x^2}\,dx = \frac{1}{a}\operatorname{arctg}\frac{x}{a} + c \quad a \neq 0,\ a \in \mathbb{R}$

$\int \frac{1}{a^2-x^2}\,dx = \frac{1}{2a}\ln\left|\frac{a+x}{a-x}\right| + c \quad a \neq 0,\ a \in \mathbb{R}$

$\int \frac{1}{\sqrt{a^2-x^2}}\,dx = \arcsin\frac{x}{a} + c \quad a > 0,\ a \in \mathbb{R}$

$\int \frac{1}{\sqrt{x^2 \pm a^2}}\,dx = \ln|x + \sqrt{x^2 \pm a^2}| + c$

$(a \pm b)^2 = a^2 \pm 2ab + b^2$

$a^2 - b^2 = (a+b)(a-b)$

$\sin 2x = 2\sin x \cos x$

$\cos 2x = \cos^2 x - \sin^2 x$

$\sin^2 x + \cos^2 x = 1$

$\sin^2 x = \frac{1-\cos 2x}{2}$

$\cos^2 x = \frac{1+\cos 2x}{2}$

Př.: $\int \left(4x^3 - 6x^2 + 2x - 3 + \frac{1}{4x^9} - \frac{3}{5x} + 4\sqrt{x^5} - \frac{3}{\sqrt[3]{x^2}}\right) dx =$

$= \int 4x^3 dx - \int 6x^2 dx + \int 2x\,dx - \int 3\,dx + \int \frac{1}{4x^9}\,dx - \int \frac{3}{5x}\,dx + \int 4\sqrt{x^5}\,dx - \int \frac{3}{\sqrt[3]{x^2}}\,dx =$

$= 4\int x^3 dx - 6\int x^2 dx + 2\int x\,dx - 3\int dx + \frac{1}{4}\int \frac{1}{x^9}\,dx - \frac{3}{5}\int \frac{1}{x}\,dx + 4\int x^{\frac{5}{2}}\,dx - 3\int \frac{1}{x^{\frac{2}{3}}}\,dx =$

$= 4\frac{x^4}{4} - 6\frac{x^3}{3} + 2\frac{x^2}{2} - 3x + \frac{1}{4}\cdot\frac{x^{-8}}{-8} - \frac{3}{5}\ln|x| + 4\cdot\frac{x^{\frac{7}{2}}}{\frac{7}{2}} - 3\frac{x^{\frac{1}{3}}}{\frac{1}{3}} + c =$

$\int x^n dx = \frac{x^{n+1}}{n+1} + c \quad c \in \mathbb{R},\ n \in \mathbb{R},\ n \neq -1 \qquad \int \frac{1}{x}\,dx = \ln|x| + c$

$\frac{7}{2} = 3\frac{1}{2}$ $\qquad x^{\frac{7}{2}} = x^{3+\frac{1}{2}} = x^3 \cdot \sqrt{x} = x^3\sqrt{x}$ $\qquad \frac{2\sqrt{x^3}}{x}$

$= x^4 - 2x^3 + x^2 - 3x - \frac{1}{12x^8} - \frac{3}{5}\ln|x| + 2\sqrt{x^7} - 9\sqrt[3]{x} + c$

Př.: $\int \frac{(4-x)^2}{4x^2}\,dx = \int \frac{16 - 8x + x^2}{4x^2}\,dx = \int \left(\frac{16}{4x^2} - \frac{8x}{4x^2} + \frac{x^2}{4x^2}\right) dx =$

$\int \left(\frac{4^2}{x^2} - \frac{2}{x} + \frac{1}{4}\right) dx = 4\int x^{-2}\,dx - 2\ln|x| + \frac{1}{4}x + c = -\frac{4}{x} - 2\ln|x| + \frac{x}{4} + c$

$4 \cdot \frac{1}{x^2} \quad 4x^{-2} \quad 2 \cdot \frac{1}{x} \quad x^{-1} = \frac{1}{x} \quad -4x^{-1} = -4\cdot\frac{1}{x} = -\frac{4}{x}$

$(a-b)^2 = a^2 - 2ab + b^2$

$\int x^n dx = \frac{x^{n+1}}{n+1} + c \qquad \int \frac{1}{x}\,dx = \ln|x| + c \qquad \int k\,dx = k\int dx = kx + c$

Př.: $\int \frac{(3^x + 4^x)^2}{12^x}\,dx = \int \frac{3^{2x} + 2\cdot 3^x 4^x + 4^{2x}}{12^x}\,dx =$

$= \int \left(\frac{3^x 3^x}{3^x 4^x} + \frac{2\cdot 3^x 4^x}{3^x 4^x} + \frac{4^x 4^x}{3^x 4^x}\right) dx =$

$= \int \left(\left(\frac{3}{4}\right)^x + 2 + \left(\frac{4}{3}\right)^x\right) dx = \frac{\left(\frac{3}{4}\right)^x}{\ln\frac{3}{4}} + 2x + \frac{\left(\frac{4}{3}\right)^x}{\ln\frac{4}{3}} + c$

$3^{2x} = 3^x 3^x$

$4^{2x} = 4^x 4^x$

$12^x = (3\cdot 4)^x = 3^x 4^x$

$(a \cdot b)^r = a^r \cdot b^r$

$\frac{a^r}{b^r} = \left(\frac{a}{b}\right)^r$

$\int a^x dx = \frac{a^x}{\ln a} + c \quad a > 0,\ a \neq 1,\ a \in \mathbb{R}$

Př.: $\int \frac{\cos 2x}{\sin^2 2x}\,dx = \int \frac{\cos^2 x - \sin^2 x}{4\sin^2 x \cos^2 x}\,dx =$

$\int \left(\frac{\cos^2 x}{4\sin^2 x \cos^2 x} - \frac{\sin^2 x}{4\sin^2 x \cos^2 x}\right) dx = \int \left(\frac{1}{4\sin^2 x} - \frac{1}{4\cos^2 x}\right) dx =$

$= -\frac{1}{4}\operatorname{cotg} x - \frac{1}{4}\operatorname{tg} x + c$

$\cos 2x = \cos^2 x - \sin^2 x$

$\sin 2x = 2\sin x \cos x$

$\int \frac{1}{\cos^2 x}\,dx = \operatorname{tg} x + c$

$\int \frac{1}{\sin^2 x}\,dx = -\operatorname{cotg} x + c$

Př.: $\int \cos^2 x\,dx = \int \frac{1+\cos 2x}{2}\,dx =$

$= \int \left(\frac{1}{2} + \frac{\cos 2x}{2}\right) dx = \frac{1}{2}x + \frac{1}{2}\cdot\frac{\sin 2x}{2} + c$

$= \frac{2x + \sin 2x}{4} + c$

$\cos^2 x = \frac{1+\cos 2x}{2}$

$\int \cos x\,dx = \sin x + c$

$\int \cos kx\,dx = \frac{\sin kx}{k} + c$

Př.: $\int \sin^2 x\,dx = \int \frac{1-\cos 2x}{2}\,dx = \int \left(\frac{1}{2} - \frac{\cos 2x}{2}\right) dx =$

$= \frac{1}{2}x - \frac{1}{2}\cdot\frac{\sin 2x}{2} + c = \frac{2x - \sin 2x}{4} + c$

Př.: $\int \frac{1}{\sqrt{1+x^2}\cdot \operatorname{arcsin} x}\,dx = \int \frac{\frac{1}{\sqrt{1-x^2}}}{\operatorname{arcsin} x}\,dx =$

$= \ln|\operatorname{arcsin} x| + c$

$\int \frac{f'(x)}{f(x)}\,dx = \ln|f(x)| + c$

$\int \frac{1}{x}\,dx = \ln|x| + c$

$\int \frac{1}{\sqrt{\varphi}}\,d\varphi = \ln|\varphi| + c$

INDE:

$\int \frac{dx}{\sqrt{1-x^2}\cdot \operatorname{arcsin} x} = \left|\begin{matrix} \operatorname{arcsin} x = t \\ \frac{1}{\sqrt{1-x^2}}\,dx = 1\,dt \end{matrix}\right| = \int \frac{dt}{t} = \ln|t| + c$

$= \ln|\operatorname{arcsin} x| + c$

Př.: $\int \frac{x^2+7x-7}{7+x^2}\,dx = \int \left(\frac{x^2+7}{7+x^2} - \frac{7}{7+x^2}\right) dx = \int \left(1 - 7\cdot\frac{1}{7+x^2}\right) dx =$

$\int \frac{1}{a^2+x^2}\,dx = \frac{1}{a}\operatorname{arctg}\frac{x}{a} + c \quad a \neq 0,\ a \in \mathbb{R}$

$= x - 7\cdot\frac{1}{\sqrt{7}}\operatorname{arctg}\frac{x}{\sqrt{7}} + c$

Př.: $\int \frac{x-3+3-3}{\sqrt[3]{x+3}}\,dx = \int \frac{x+3-6}{\sqrt[3]{x+3}}\,dx = \int \left(\frac{x+3}{\sqrt[3]{x+3}} - \frac{6}{\sqrt[3]{x+3}}\right) dx =$

$= \int (x+3)^{\frac{2}{3}}\,dx - 6\int (x+3)^{-\frac{1}{3}}\,dx = \left|\begin{matrix} \text{substituce:} \\ x+3 = t \\ (x+3)' = (t)' \\ 1\,dx = 1\,dt \end{matrix}\right| = \int t^{\frac{2}{3}}\,dt - 6\int t^{-\frac{1}{3}}\,dt =$

$= \frac{t^{\frac{5}{3}}}{\frac{5}{3}} - 6\cdot\frac{t^{\frac{2}{3}}}{\frac{2}{3}} + c = \frac{3}{5}\sqrt[3]{(x+3)^5} - 9\sqrt[3]{(x+3)^2} + c$

$\int x^n dx = \frac{x^{n+1}}{n+1} + c$