Př: $$\int x\sqrt[3]{1-x^2}\,dx = \left| \begin{array}{l} 1-x^2 = t \\ (1-x^2)' = t' \\ -2x\,dx = 1\,dt \quad /:(-2) \\ x\,dx = -\frac{dt}{2} \end{array} \right| = \int \sqrt[3]{t}\cdot\left(-\frac{dt}{2}\right) = -\frac{1}{2}\int t^{\frac{1}{3}}dt =$$

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

$$= -\frac{1}{2}\frac{t^{\frac{4}{3}}}{\frac{4}{3}} + c = -\frac{1}{2}\cdot\frac{3}{4}(1-x^2)^{\frac{4}{3}} + C = -\frac{3}{8}\sqrt[3]{(1-x^2)^4} + C$$

Př: $$\int \frac{4^{1-\ln^2 x}\cdot \ln x}{x}\,dx = \left| \begin{array}{l} 1-\ln^2 x = t \\ (1-\ln^2 x)' = (t)' \\ -2\frac{\ln x}{x}dx = dt \\ \frac{\ln x}{x}\cdot dx = -\frac{dt}{2} \end{array} \right| = -\frac{1}{2}\int 4^t dt =$$

$$\left\{ \int a^x dx = \frac{a^x}{\ln a} + c \right.$$

$$= -\frac{1}{2}\frac{4^t}{\ln 4} + C = -\frac{4^{1-\ln^2 x}}{2\ln 4} + C$$

Př: $$\int \frac{\sin x}{\sqrt{\cos^2 x + 3}}\,dx = \left| \begin{array}{l} \cos x = t \\ -\sin x\,dx = dt \end{array} \right| = -\int \frac{1}{\sqrt{t^2+3}}\,dt =$$

$$\left\{ \int \frac{dx}{\sqrt{x^2 \pm a^2}} = \ln\left|x + \sqrt{x^2 \pm a^2}\right| + c \right.$$

$$= -\ln\left|t + \sqrt{t^2+3}\right| + C = -\ln\left|\cos x + \sqrt{\cos^2 x + 3}\right| + c$$

Př: $$\int \frac{\cos x}{\sin^2 x + 8\sin x + 26}\,dx = \left| \begin{array}{l} \sin x = t \\ \cos x\,dx = dt \end{array} \right| = \int \frac{1}{t^2+8t+26}\,dt = *$$

$$\overset{a}{1}t^2 \overset{b}{+8}t \overset{c}{+26} = (\quad)(\quad)$$

$$D = b^2 - 4ac > 0$$

$$8^2 - 4\cdot 1\cdot 26 = 64 - 104 = -40$$

$$\sqrt{D} = \sqrt{-40} \notin \mathbb{R}$$

NEMÁ REÁLNE KORENE

ÚPRAVA NA ŠTVOREC:

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

$t^2 + 8t + 26$

$(t+4)^2 +$ konštanta

$$t^2 + 8t + 16 + 10$$

$$t^2 + 8t + 26 = (t+4)^2 + 10$$

$$* = \int \frac{1}{(t+4)^2 + 10}\,dt = \left| \begin{array}{l} t+4 = s \\ dt = ds \end{array} \right| = \int \frac{1}{s^2+10}\,ds =$$

$$\left\{ \int \frac{1}{a^2+x^2}dx = \frac{1}{a}\operatorname{arctg}\frac{x}{a} + c \right.$$

$$= \frac{1}{\sqrt{10}}\operatorname{arctg}\frac{s}{\sqrt{10}} + c = \frac{1}{\sqrt{10}}\operatorname{arctg}\frac{t+4}{\sqrt{10}} + c = \frac{1}{\sqrt{10}}\operatorname{arctg}\frac{\sin x + 4}{\sqrt{10}} + c$$

Př: $$\int \frac{dx}{\sqrt{8 - 6x - 9x^2}} = \int \frac{dx}{\sqrt{9 - (3x+1)^2}} = \left| \begin{array}{l} 3x+1 = t \\ 3\,dx = dt \\ dx = \frac{dt}{3} \end{array} \right| = \frac{1}{3}\int \frac{dt}{\sqrt{9-t^2}} = *$$

$$\left\{ \int \frac{dx}{\sqrt{a^2-x^2}} = \arcsin\frac{x}{a} + c \right.$$

ÚPRAVA NA ŠTVOREC:

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

$$-9x^2 - 6x + 8 = -(9x^2 + 6x - 8)$$

$$-\left[(3x+1)^2 - 9\right] = 9 - (3x+1)^2$$

$$9x^2 + 6x + 1$$

$$* = \frac{1}{3}\arcsin\frac{t}{3} + C = \frac{1}{3}\arcsin\frac{3x+1}{3} + C$$

Př: $$\int \frac{dx}{x\ln x\,\ln\ln x} = \left| \begin{array}{l} \ln x = t \\ \frac{1}{x}dx = dt \end{array} \right| = \int \frac{dt}{t\ln t} = \left| \begin{array}{l} \ln t = s \\ \frac{1}{t}dt = ds \end{array} \right| =$$

$$\left\{ \begin{array}{l} \ln x > 0 \wedge \ln x \neq 1 \\ (1, e) \cup (e, \infty) \end{array} \right.$$

$$\int \frac{\frac{1}{t}\,f'}{\ln t\,f}\,dt$$

$$\left\{ \int \frac{f'}{f}dx = \ln|f| + c \right.$$

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

$$= \int \frac{ds}{s} = \ln|s| + c = \ln|\ln t| + c = \ln|\ln\ln x| + c$$

Inak: $$\left| \begin{array}{l} \ln\ln x = t \\ \frac{1}{\ln x}\cdot\frac{1}{x}dx = dt \end{array} \right| = \int \frac{dt}{t}$$

Př: $$\int e^{\sqrt{x}}\,dx = \left| \begin{array}{l} x = t^2 \\ dx = 2t\,dt \end{array} \right| = \int e^t\cdot 2t\,dt = 2\int t\,e^t\,dt = *$$

PER PARTES: $$\int u(x)\cdot v'(x)\,dx = u(x)\,v(x) - \int u'(x)\cdot v(x)\,dx$$

$\overset{u(x)}{P_n(x)}\ \overset{v'(x)}{e^x}$	$\overset{v'(x)}{P_n(x)}\ \overset{u(x)}{\ln x}$
$P_n(x)\,a^x$	$P_n(x)\arcsin x$
$P_n(x)\cos x$	$P_n(x)\arccos x$
$P_n(x)\sin x$	$P_n(x)\operatorname{arctg} x$
	$P_n(x)\operatorname{arccotg} x$

$$* = 2\int \overset{u}{t}\,\overset{v'}{e^t}\,dt = \left| \begin{array}{ll} u = t & v' = e^t \\ u' = 1 & v = e^t \end{array} \right| = 2\left(t\cdot e^t - \int 1\cdot e^t\,dt\right) =$$

$$2\left(t e^t - e^t\right) + c = 2e^{\sqrt{x}}\left(\sqrt{x} - 1\right) + C$$

$$x = t^2$$

$$\sqrt{x} = t$$