Odmocniny

$$\int \frac{1 \cdot 3\sqrt[3]{(x+2)^2}}{\sqrt[3]{(x+2)^2} - 3\sqrt[3]{x+2} - 4} \cdot \frac{1}{3}\frac{1}{\sqrt[3]{(x+2)^2}}\, dx$$

$t = \sqrt[3]{x+2}$. $x = t^3 - 2$ $dx = 3t^2 dt$

$\varphi(t) = t^3 - 2$ $\varphi' = 3t^2$

$\Rightarrow t \neq 0$

$$\int \frac{1}{t^2 - 3t - 4} 3t^2\, dt = \int 3 - \frac{3/5}{1+t} + \frac{48/5}{t-4}\, dt$$

$(-1,0)\ (0,4)$

$t \in (-\infty, -1),\ \sout{-1,4)},\ (4,\infty) \Rightarrow (\alpha, \beta)$

$$\overset{c}{=} 3t - \frac{3}{5}\ln|1+t| + \frac{48}{5}\ln|t-4| =$$

$$= 3\sqrt[3]{x+2} - \frac{3}{5}\ln|1+\sqrt[3]{x+2}| + \frac{48}{5}\ln|-4+\sqrt[3]{x+2}|$$

1 vos.

$$dt = \frac{1}{3}\frac{1}{\sqrt[3]{(x+2)^2}}dx$$

$\sqrt[3]{x+2} = t$

$t^2 - 3t - 4 \neq 0$ $t \neq 4$

$(t-4)(t+1) \neq 0$ $t \neq -1$

$\sqrt[3]{x+2} \neq -1$ $\sqrt[3]{x+2} \neq 4$

$x+2 \neq -1$ $x+2 \neq 64$

$x \neq -3$ $x \neq 62$

$x \in (-\infty, -3),\ (-3, 62),\ (62, \infty)$

$a_1\ b_1$ $a_2\ b_2$

$\varphi = t^3 - 2$

	t	φ	x
(α_1, β_1)	$(-\infty, -1)$	$\longrightarrow$	$(-\infty, -3)$
(α_2, β_2)	$(4, \infty)$	$\xrightarrow{\varphi}$	$(62, \infty)$
α_3, β_3	$(-1, 0)$	$\xrightarrow{\varphi}$	$(-3, -2)$

$a_3\ b_3$

α_1 β_1 $(0, 4) \xrightarrow{\varphi} (-2, 62)$

$x \in (a, b)$

$\Longrightarrow$

$\sqrt{5} - 2 = x$ ... le prime

$$\int \frac{1}{x^2}\sqrt{\frac{1+x}{x}}\,dx \quad \rightarrow \quad x \in (-\infty, -1) \;\; (a,\, b), \quad (0, \infty)$$

$(0,1)$ $\quad (\alpha, \beta)$

$(1, \infty)$

$$t = \sqrt{\frac{1+x}{x}} \qquad t^2 = \frac{1+x}{x}$$

$$x t^2 = 1 + x \qquad x(t^2-1) = 1 \qquad x = \frac{1}{t^2-1}$$

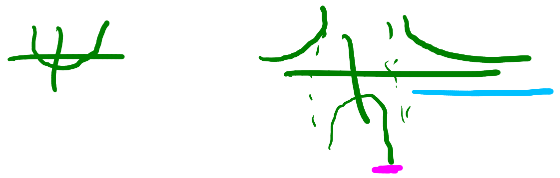
$$dx = \frac{-1}{(t^2-1)^2}\, 2t \; dt$$

$t \in \mathbb{R}$

$$\int \frac{1}{\left(\frac{1}{t^2-1}\right)^2} \cdot t \cdot \frac{-2t}{(t^2-1)^2}\, dt = \int -2t^2 \, dt$$

$$\overset{c}{=} -\frac{2}{3}t^3 = -\frac{2}{3}\sqrt{\left(\frac{1+x}{x}\right)^3}$$

$$x = \varphi(t) = \frac{1}{t^2-1} \qquad \varphi' = \frac{-2t}{(t^2-1)^2}$$



$t \neq 0$

$t \in (\alpha, \beta) \xrightarrow{\varphi \text{ na}} (a, b)$

$(0,1) \longrightarrow (-\infty, -1)$ $\quad a_1, b_1$

$(1, \infty) \longrightarrow (0, \infty)$ $\quad a_2, b_2$

2V o subs. t

$x \in (-\infty, -1)$, $(0, \infty)$:-)

$$\sqrt{(x-2)(x+3)} = \sqrt{\frac{x-2}{x+3}(x+3)^2}$$

$$= |x+3|\sqrt{\frac{x-2}{x+3}}$$

- $\int \frac{1}{\sqrt{x^2+x+1}}\,dx \to x \in \mathbb{R}$ a, b

$t = \underbrace{\sqrt{x^2+x+1}}_{>\sqrt{x^2}} - x$

$t + x = \sqrt{x^2+x+1}$

$x^2 + t2x + t^2 = x^2 + x + 1$

$x(2t-1) = 1 - t^2$

$x = \frac{1-t^2}{2t-1}$

$dx = -2\,\frac{t^2-t+1}{(1-2t)^2}$

$$\int \frac{1}{t + \frac{1-t^2}{2t-1}} \cdot -2 \cdot \frac{(t^2-t+1)}{(1-2t)^2}\,dt$$

α, β

$t \in (-\infty, \frac{1}{2})$

$(\frac{1}{2}, \infty)$

$$= \int \frac{-2(t^2-t+1)}{\frac{2t^2-t+1-t^2}{2t-1}} \cdot \frac{1}{(1-2t)^2}\,dt = \int -2\,\frac{-1}{1-2t}\,dt$$

$+t^2 - t + 1$

$$\stackrel{c}{=} \frac{2}{-2}\ln|1-2t| = -\ln|1-2(\sqrt{x^2+x+1}-x)|$$

$x \in (a,b) = \mathbb{R}$

$\varphi(t) = \frac{1-t^2}{2t-1}$ $\quad \varphi' = -2 \cdot \frac{t^2-t+1}{(1-2t)^2}$ $\neq 0$ vždy

$\varphi: (\alpha, \beta) \xrightarrow[\varphi]{NA} (a,b) = \mathbb{R}$

$(\frac{1}{2}, \infty) \longrightarrow (-\infty, \infty)$ ✓

$(-\infty, \frac{1}{2}) \longrightarrow (-\infty, \infty)$