$\int \frac{dx}{a^2+x^2} = \frac{1}{a} arctg \frac{x}{a} \ (a > 0)$ $\quad \int \frac{dx}{a^2-x^2} = \frac{1}{2a} \ln \frac{|a+1|}{|a-x|}$ $\quad \int \frac{dx}{\sqrt{a^2-x^2}} = \arcsin \frac{x}{a}$

$\int \frac{dx}{\sqrt{x^2 \pm a^2}} = \ln |x + \sqrt{x^2 \pm a^2}|$ $\quad \int \frac{dx}{sh^2 x} = -\operatorname{cth} x$ $\quad \int \frac{dx}{ch^2 x} = \operatorname{th} x$

$\int \frac{P_n(x)}{Q_m(x)} dx = \frac{P_{m-k-1}}{Q_{m-k}} + \int \frac{R_{k-1}(x)}{Q_k(x)} dx$

$\int \frac{P_n(x)}{y} dx = Q_{n-1}(x)y + \lambda \int \frac{dx}{y}, \ y = \sqrt{ax^2 + by + c}$

$t = \frac{x+a}{x+b} \Longrightarrow dt = \frac{(b-a)dx}{(x+b)^2}$ ИЛИ $x = \frac{bt-a}{t-1} \Longrightarrow x + a = \frac{(a-b)t}{t-1}$ и $x + b = \frac{a-b}{t-1}$

$t = \operatorname{tg} \frac{x}{2}, \ \sin x = \frac{2t}{1+t^2}, \ \cos x = \frac{1-t^2}{1+t^2}$

$\int \frac{a_1 \sin x + b_1 \cos x + c_1}{a \sin x + b \cos y + c} dx = Ax + B \ln |a \sin x + b \cos y + c| + C \int \frac{dx}{a \sin x + b \cos y + c}$

$\int \sin^n x dx = -\frac{1}{n} \cos x \sin^{n-1} x + \frac{n-1}{n} \int \sin^{n-2} x dx$

$\int \cos^n x dx = \frac{1}{n} \sin x \cos^{n-1} x + \frac{n-1}{n} \int \cos^{n-2} x dx$

$\int_0^{\frac{\pi}{2}} f(\sin x) dx = \int_0^{\frac{\pi}{2}} f(\cos x) dx$ $\quad \int_0^{\pi} x f(\sin x) dx = \frac{\pi}{2} \int_0^{\pi} f(\sin x) dx$

$F(x) = \int_{\varphi_1(x)}^{\varphi_2(x)} f(t) dt \Longrightarrow F'(x) = f(\varphi_2(x))\varphi_2'(x) - f(\varphi_1(x))\varphi_1'(x)$

$S = \int_{T_0}^{T_1} x(t) y'(t) dt = -\int_{T_0}^{T_1} x'(t) y(t) dt = \frac{1}{2} \int_{\alpha}^{\beta} r^2(\varphi) d\varphi$

$V_{ox} = \pi \int_a^b f^2(x) dx = \pi \int_a^b y^2(x) x' dt$

$V_{oy} = \pi \int_a^b f(x) dx^2 = 2\pi \int_{t_1}^{t_2} x(t) y(t) dx(t)$

$|\Gamma| = \int_{T_0}^{T_1} \sqrt{(x'(t))^2 + (y'(t))^2 + (z'(t))^2} dt$

$|\Gamma| = \int_a^b \sqrt{1 + (y')^2} dx$

$|\Gamma| = \int_{\alpha}^{\beta} \sqrt{(r(\varphi))^2 + (r'(\varphi))^2} d\varphi = \int_{\alpha}^{\beta} \sqrt{r^2 \cdot (\varphi')^2 + (r')^2} \cdot sgn(\varphi') d\varphi$