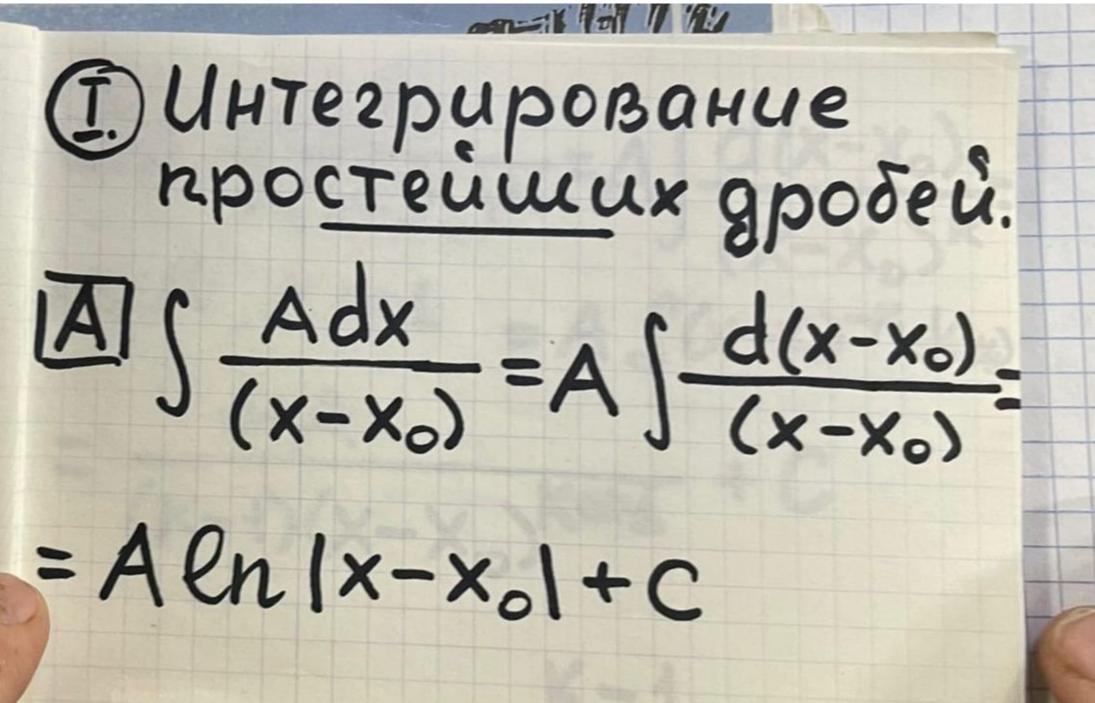
§ 2 Интегрирование рациональных дробей.



B $\int \frac{A dx}{(x-x_0)^K} = A \int \frac{d(x-x_0)}{(x-x_0)^K}$ $K \in \mathbb{N}, K \neq 1 = A \int (x-x_0)^K dx_0$ = (K-1)(X-X)K-1 + C K-1

$$\frac{C}{x^{2}+px+q} dx = \frac{1}{x^{2}+px+q} dx$$

$$=\int \frac{Mt - \frac{Mp}{2} + N}{t^2 - pt + \frac{p^2}{4} + pt - \frac{p^2}{2} + q} dt$$

$$= M \int \frac{t}{t^2 + a^2} + \frac{2N - Mp}{2} dt$$

$$= M \int \frac{t^2 + a^2}{t^2 + a^2} + \frac{2N - Mp}{2} dt$$

$$= (a^2 = q - \frac{p^2}{4} > 0)$$

$$= = \frac{M}{2} \ln(t^2 + a^2) + \frac{2N - Mp}{2a} \arctan(t \frac{t}{a} + c) + \frac{2N - Mp}{2a} \arctan(t \frac{t}{a} + c) + \frac{M}{2} \ln(x^2 + px + q) +$$

HIN HIE $= + \frac{2N - MP}{\sqrt{4q - P^2}} \operatorname{arctg} \frac{2x + P}{\sqrt{4q - P^2}} + C$ 1 (x2+px+q1e dx l>1 (x2+px+q1e p2-48<0 e # 1; t= x+2

A 18: 17 = (d x =) e

 $=\frac{1}{a^2}\int_{\ell-1}^{2} + \frac{x}{2a^2(\ell-1)(x^2+a^2)^{\ell-1}}$ 202(l-1) Te-1.

$$\int \frac{dx}{(x^2 + a^2)^2} = \frac{1}{a^2} \int \frac{(a^2 + x^2) - x^2}{(x^2 + a^2)^2} dx$$

$$= \frac{1}{a^2} \int \frac{dx}{x^2 + a^2} = \frac{1}{a^2} \int \frac{x \cdot x}{(x^2 + a^2)^2} dx$$

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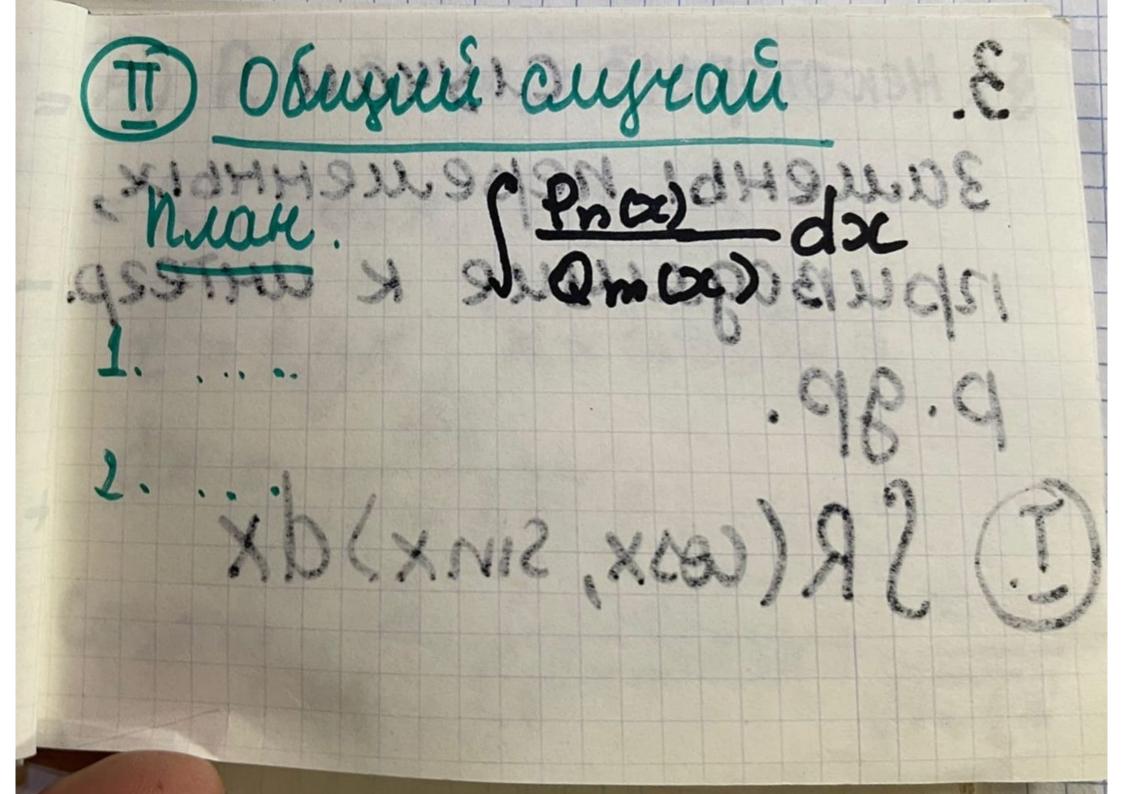
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$$\int \frac{1}{a^2} \int \frac{dx}{x^2 + a^2} dx$$

$$= \frac{1}{a^{3}} \operatorname{anctg} \frac{\alpha}{a} + \frac{\alpha}{2 a^{2} (x^{2} + a^{2})} - \frac{1}{2 a^{2}} \int \frac{dx}{x^{2} + a^{2}} = \frac{\operatorname{anctg} \frac{3c}{a}}{2 a^{2} (x^{2} + a^{2})} + \frac{\alpha}{2 a^{2} (x^{2} + a^{2})} - \frac{1}{2 a^{3}} \operatorname{anctg} \frac{x}{a} + c$$

$$+ \frac{2 a^{2} (x^{2} + a^{2})}{2 a^{3}} - \frac{1}{2 a^{3}} \operatorname{anctg} \frac{x}{a} + c$$



§3. Некоторые случаи rpubagoenque k anter p.gp. (I) SR(cosx, sinx)dx

A)
$$R(-\cos x, -\sin x) =$$

$$= R(\cos x, \sin x).$$

$$t = tgx; x = \operatorname{arctg} t$$

$$dx = \frac{dt}{1+t^2};$$

$$\cos x = \frac{t}{\sqrt{1+t^2}}; \sin x = \frac{t}{\sqrt{1+t^2}}$$

B) Obusuú cuyraú.

$$t = tg \times x = 2 \text{ arct} g t;$$

 $dx = \frac{2dt}{1+t^2};$
 $cosx = \frac{1-t^2}{1+t^2}; sinx = \frac{2t}{1+t^2}$

$$III \int R\left(\frac{(\alpha x + \beta)^{\frac{\gamma}{s_{1}}}}{(cx + d)^{\frac{\gamma}{s_{1}}}}, \frac{(\alpha x + \beta)^{\frac{\gamma}{s_{2}}}}{(cx + d)^{\frac{\gamma}{s_{2}}}}\right) dx$$

$$7 \in \mathbb{Z}, 5 \in \mathbb{A}$$

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Пинтегрирование дифференциального бинома.

OI Burpamerue Buga $x^{m}(a+bx^{n})^{p}dx$, $m,n,p\in Q; a,b\neq 0$ Случай 1. $p \in \mathbb{Z}, m = \frac{\tau_1}{S_1}, n = \frac{\tau_2}{S_2}$ Bauera t = oc, rge S=H.O.K.(S1,S2) (au. T.)

Случай 2. Замена a+bxn t=(a+6xn)1/s

p\$Z, p==; m+1 \$Z m+1+p∈ 2. Замена $ax^{-n} + b = t^{s}; x = (\frac{t^{s} - b}{a})$ $x^m(a+bx^n)^p =$ $= x^{m+np}(ax^{-n}+b)^{r}$

T. 4e Soumë Ba.

При значениях параuerpob m,n,p, rue yg-x cryrasu 1-3 u-1 ot guppp. du noma me ebrietas quementaphqu - p-eû.

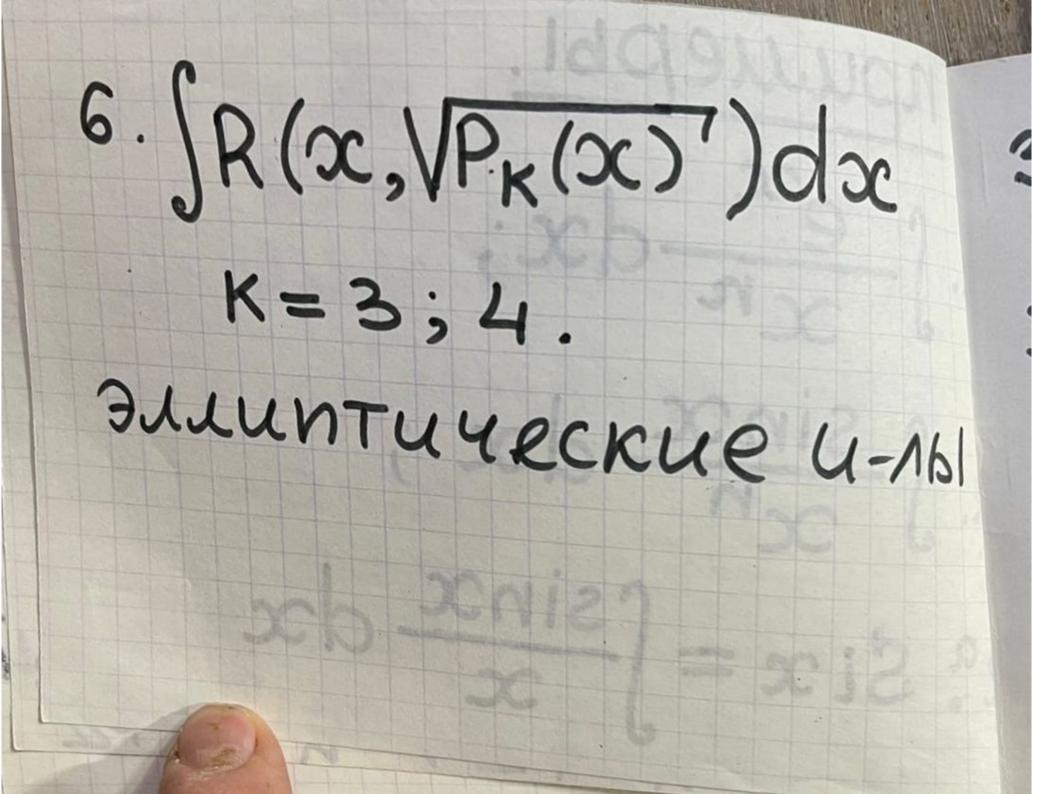
Функцияши.

 $\int \frac{dx}{1+x^3} = 0$ $\int \frac{1}{1+x^3} = 0$ $\int \frac$

npuuepbl.

$$2. \int \frac{\sin \infty}{\infty} d\infty$$

$$2^{\alpha}. Six = \int \frac{sinx}{x} dx$$



3. Just da $3^{2} \int \frac{\cos x}{x} dx = \cos x$ 4. \[e^{-\infty} dx 5. Li $x = \int \frac{dx}{enx}$