

trample dx ln |x+a| = xx+a , dx atana = 1 2+ x2  $\int \frac{1}{(\chi^2+1)(\chi^2+4)} dx = \int \frac{Ax+B}{\chi^2+1} + \frac{Cx+D}{\chi^2+4} dx$ = Alm 1x2+11 + B tan x dx + [2] lm |x2+41 + D. ] tan 2 + C,
beigh Algebra: (x2+1)(x2+4) = Ax+B + Cx+D = (X2+4)+(Cx+D)(x2+1)  $1 = Ax^3 + 4Ax + Bx^2 + 4B + Cx^3 + Cx + Dx^2 + D$ = (A+C)x3 + (B+D)x2 + (A+C)x + 4B+D  $(4)-(2):3B=1,B=\frac{1}{3}$ \$ A+C =0 7+1 B+D = 0 4A+C = 0 and  $D = -B = -\frac{1}{2}$ ~(3) (3)-(1): 3A = 0 , A = C = 0L48+D=) <u> (۴</u>۲)  $\int \frac{x+1}{(x^2+1)(x^2+4)} dx =$ How about Sane calculation X+1 = 18+0) x + (8+D) x + (4A+C) x + (18+D) = { lm |x2+1 } A+C ≥0 -(1)

B+D=D - Q)

4β+D=1-47 + } tan x - th 1x+41  $-\frac{1}{2} \tan^2 \frac{x}{2} + (\frac{x}{2})$ 1 = AE = (1) - (E)A= 1/3, C=-A=-1/3 (4)-(1) => B=1/3, D=-1/3

Consider a proper rational function.

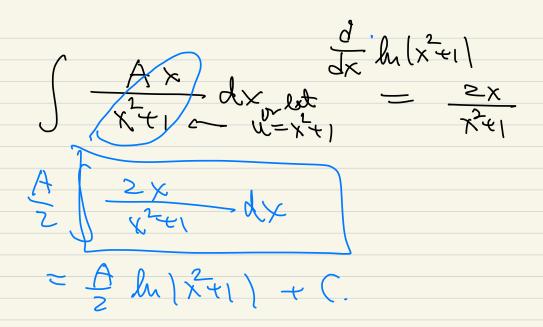
I (x) , where degree of p(x) < degree of q(x)

polynomials a sum of A BX+C = can be done terms like standard by standard witigration formulas. Slightly more complicated if we have repeated factors! = \( \frac{A}{x-1} + \frac{B}{x-2} + \frac{C}{x+4} + \frac{(x+4)^2}{x} \, dx  $= A \ln |x-1| + B \ln |x-2| + C \ln |x+4| - D(x-4) + C,$   $\frac{x+2x-1}{x+2x-1} = A (x-2)(x+4)^{2} + B(x+1)(x+4)^{2} + C(x-1)(x+4) + D(x-1)(x-2)$ Let x = 1,  $1+2-1 = A(-1)(5)^{2}$ ,  $A = -\frac{2}{25}$ x = 2  $8+4-1 = B(1)(6)^2$ ,  $B = \frac{11}{36}$  $\int_{0}^{2} (4+x) (-x) \frac{1}{36} + \frac{2}{36} (x-2) \frac{2}{36} - \frac{1}{36} (x-1) \frac{2}{36} = 1-45 + \frac{2}{36}$ (5-x)(x-x)(+ (4+x)(5-x)(x-x)) T  $\gamma$   $\chi = -4$  $D = \frac{30}{-23}$  -94 - 8 - 1 = D(-4-1)(4-5) = 30DPut x=0, -1=-3-(2)(4)+ 11(-1)(4)-+C(8) = 30-2 C = an ungly number !

e. dog pla) < krthet-then

[x-a, k, (x-a) ... (x-an) dx

Sum of the form the form to the f (X-1) (x+4) partal fraction de composition = \[\frac{A}{X-1} + \frac{\beta x^2 + \psi}{\chi^2 + \psi} + \frac{\beta x + \beta^2}{\chi^2 + \psi^2} \] dx J 2 seço do 16 seço do A Certic polymid = { Corodo a well-known integred! X244 + Bx+E (X246)3



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