24th lesson

https://www2.karlin.mff.cuni.cz/~kuncova/en/teaching.php,
kuncova@karlin.mff.cuni.cz

Theory

Algoritmus

1. We check the polynomial degree. We divide them, if necessary.
2. We decompose the denominator into brackets.
3. We check again the quadratic polynomials, if they have roots.
4. We apply the partial fraction decomposition.
5. We integrate.

Exercises

Find F - the antiderivative of a function f at the maximal (open) set. (Specify the set.)

1. $f(x) = \dfrac{x}{(x+1)(x+2)(x+3)}$
2. $f(x) = \dfrac{x}{x^3-1}$
3. $f(x) = \dfrac{x^3+1}{x^3-5x^2+6x}$
4. $f(x) = \dfrac{x^4}{x^4+5x^2+4}$
5. $f(x) = \dfrac{x^2+1}{(x+1)^2(x-1)}$
6. $f(x) = \dfrac{1}{x(1+x)(1+x+x^2)}$
7. $f(x) = \left(\dfrac{x}{x^2-3x+2}\right)^2$
8. $f(x) = \dfrac{1}{x^3+1}$

(4) for the decomposition (not for the integration!) consider $t = x^2$