

Prs 8.4 ZI  
30 min

$A_2 \bar{z}$ ,  $uA_2 \bar{z}$ , Perporfes / subtruce  
Open book

$$\frac{\frac{1}{a} + \frac{1}{b}}{\frac{1}{a} - \frac{1}{b}}$$

prevest na vac. funkci

$\sum x_n$        $x_n \in \mathbb{C}$

$x_n = a_n + ib_n$

$\sum a_n$  &

$\sum b_n$  &

$\sum a_n + ib_n$

$$\sum_{n=1}^{\infty} \frac{1}{n^2 + 2i} = \sum \frac{1}{n^2 + 2i} \cdot \frac{n^2 - 2i}{n^2 - 2i} = \sum \frac{n^2 - 2i}{n^4 - 4i^2}$$

$$= \sum \frac{n^2 - 2i}{n^4 + 4} = \sum \underbrace{\frac{n^2}{n^4 + 4}}_{a_n} + i \underbrace{\frac{-2}{n^4 + 4}}_{b_n}$$

$\downarrow$        $\downarrow$   
 L3 &  $\frac{1}{n^2}$       L9 &  $\frac{1}{n^4}$

Zodruv:  $\sum \frac{1}{n^2 + 2i}$  &

$\sum |x_n|$  &  $\Rightarrow \sum x_n$  &

$\sum \frac{(i+2)^n}{10^n}$        $\sum \left| \frac{(i+2)^n}{10^n} \right| =$       &

$\sum \frac{|i+2|^n}{10^n} = \sum \underbrace{\left( \frac{\sqrt{5}}{10} \right)^n}_{&}$        $\Rightarrow \sum \frac{(i+2)^n}{10^n}$  &

geom.  $\sum$

$$\sum (a_n + ib_n) \quad \sqrt{a_n^2 + b_n^2} \leq$$

$$\sum |a_n| \quad \sum |b_n| \quad \checkmark$$

$$\sqrt{a_n^2} \quad \sqrt{b_n^2} \quad \checkmark$$

$$\sum_{n=1}^{\infty} \frac{e^{in\varphi}}{n} \quad \varphi \text{ param.} \quad \sum \left| \frac{e^{in\varphi}}{n} \right| = \sum \frac{1}{n}$$

$$r e^{i\alpha} = r(\cos \alpha + i \sin \alpha)$$

$$|\cos \alpha + i \sin \alpha|$$

$$\sum \frac{1}{n} \cos(n\varphi) + i \sum \frac{1}{n} \sin(n\varphi)$$

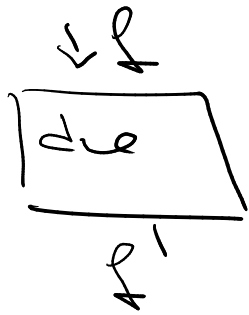
$\varphi \neq 0 + 2k\pi, k \in \mathbb{Z}$

$$\sum \frac{\cos(n\varphi)}{n} \quad \checkmark \quad \sum \frac{\sin(n\varphi)}{n} \quad \checkmark$$

$\sum_{n=1}^{\infty} \frac{1}{n} \rightarrow 0 \quad \cos(n\varphi)$   
 om. e. s.

Zähler  $\sum \frac{e^{in\varphi}}{n} \quad \checkmark \Leftrightarrow \varphi \neq 2k\pi, k \in \mathbb{Z}$

# ∫ Integral - PF



$$x^2 \rightarrow 2x$$

$$\frac{\int 2x}{x^2 + 1} = x^2 + C$$

$$\int 3x^2 dx = x^3 + C \quad x \in (-\infty, \infty)$$

$$\int \cos x dx = \sin x + C \quad x \in \mathbb{R}$$

$$\int e^x dx = e^x + C \quad x \in \mathbb{R}$$

$$\int \sqrt[3]{x} dx = \int x^{1/3} dx = \frac{x^{1/3 + 1}}{1/3 + 1} = \frac{x^{4/3}}{4/3} = \frac{3}{4} \sqrt[3]{x^4} \quad x \in \mathbb{R}$$

$$\int \frac{1}{1+x^2} + \frac{1}{\sqrt{1-x^2}} dx =$$

$$\int \frac{1}{1+x^2} dx + \int \frac{1}{\sqrt{1-x^2}} dx = \arctan x + \arcsin x$$

$$\int \frac{2}{x} dx = 2 \int \frac{1}{x} dx = 2 \ln |x|$$

$$\int \frac{1}{\sqrt{1-x^2}} = \begin{cases} \arcsin x \\ -\arccos x \end{cases}$$

$$\int \sqrt{x} dx = \frac{2}{3} x^{3/2} + C = \frac{2}{3} \sqrt{x^3} + C$$

$$= \frac{2}{3} x^{3/2} = \frac{2}{3} \sqrt{x^3}$$

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

$$\frac{1}{2} e^{2x+1} \cdot 2$$

$ax+b$

$2x-3$

$-x+7$

~~$x^2 + 15$~~

$\frac{x}{50} + \pi \checkmark$

$$\int \frac{1}{1+9x^2} = \int \frac{1}{1+(3x)^2} =$$

$$= \frac{1}{3} \arctan(3x) + C$$