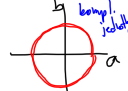


$\bar{z} = \frac{1}{z}$ $z = a+bi$
 $\bar{z} = a-bi$
 $a-bi = \frac{1}{a+bi}$
 $a-bi = \frac{1 \cdot (a-bi)}{(a+bi)(a-bi)}$
 $a-bi = \frac{a-bi}{a^2-b^2i^2}$
 $a-bi = \frac{a-bi}{a^2+b^2}$
 $a-bi = \frac{a}{a^2+b^2} - i \frac{b}{a^2+b^2}$
 $a = \frac{a}{a^2+b^2}$ $-b = \frac{-b}{a^2+b^2}$
 $a^2+b^2=1$ $a^2+b^2=1$
 $\{a+bi \mid a^2+b^2=1\}$



2 22-17:50

$(3+1)x - (2+2i)x = 3-5i + px$
 $(3+1)x - (2+2i)x - px = 3-5i$
 $x(3+1-2-2i-p) = 3-5i$
 $x(1+2i-p) = 3-5i$
 i) $1+2i-p=0$ ii) $1+2i-p \neq 0$
 $p = 1+2i$ $p \neq 1+2i$
 $x = 0 = 3-5i$ $x = \frac{3-5i}{1+2i-p}$
 \emptyset

p	k
$1+2i$	\emptyset
$\frac{3-5i}{1+2i-p}$	$\{ \frac{3-5i}{1+2i-p} \}$

 $x(1+2i-p) = 0$
 $1+2i-p=0$ $p=1+2i$ } $x=0$
 $0x = 0$
 \emptyset


2 22-18:12

$p \in \mathbb{R}$
 $\frac{p-i}{1+pi}$ je zje imaginární
 $\frac{p-i}{1+pi} \cdot \frac{1-pi}{1-pi} = \frac{(p-i)(1-pi)}{1+p^2}$
 $= \frac{p-p-i-p^2i}{1+p^2} = i \frac{-1-p^2}{1+p^2}$
 $\frac{a+bi}{c+di} \cdot (c-di)$

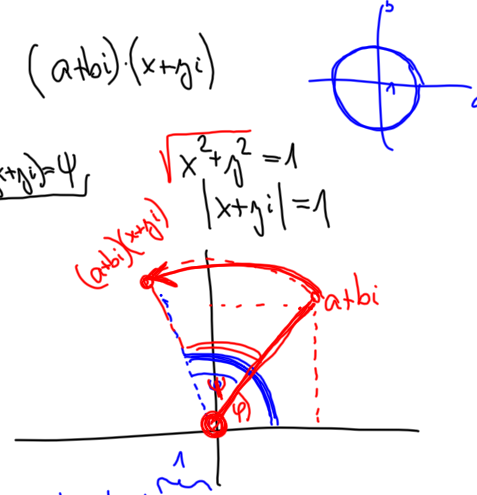
2 22-18:17

$(i-2) \cdot x - 2iy = 1$
 $x = a+bi$
 $y = a-bi$
 $(i-2)(a+bi) - 2i(a-bi) = i$
 $-2a-b + ai - 2bi - 2ai - 2b = i$
 $-2a-3b = 0$ $a+bi = 1+2i$
 $-a-2b = 1$ $a = 3$
 $a = -2b-1$
 $-2(-2b-1)-3b = 0$
 $4b-3b+2 = 0$
 $b = -2$ $3-2i$
 $a = -2b-1$ $3+2i$
 $a = 3$

2 22-18:22

z_1, z_2
 $z_1 = |z_1|(\cos \varphi_1 + i \sin \varphi_1)$
 $z_2 = |z_2|(\cos \varphi_2 + i \sin \varphi_2)$

 $z_1 \cdot z_2 = |z_1|(\cos \varphi_1 + i \sin \varphi_1) \cdot |z_2|(\cos \varphi_2 + i \sin \varphi_2)$
 $= |z_1| \cdot |z_2| (\cos \varphi_1 \cos \varphi_2 - \sin \varphi_1 \sin \varphi_2 + i(\sin \varphi_1 \cos \varphi_2 + \cos \varphi_1 \sin \varphi_2))$
 $= |z_1| \cdot |z_2| (\cos(\varphi_1 + \varphi_2) + i \sin(\varphi_1 + \varphi_2))$
 $|z_1 \cdot z_2| = |z_1| \cdot |z_2|$
 $z^n = |z|^n (\cos n\varphi + i \sin n\varphi)$
Mouvrana Veta

2 22-18:29

$(a+bi) \cdot (x+yi)$
 $\arg(x+yi) = \varphi$
 $\sqrt{x^2+y^2} = 1$
 $|x+yi| = 1$

 $|z_1 \cdot z_2| = |z_1| \cdot |z_2|$

2 22-18:36

$D = 3 + i$ $D \cdot C$
 $C = 2 + i$
 $B = 1 + i$
 $\text{arg } B \cdot C \cdot D = \color{red}{\color{blue}{\color{black}{+}}} + \color{blue}{\color{black}{+}} + \color{black}{\color{black}{+}}$
 $(1+i)(2+i)(3+i) = (1+3i)(3+i) =$
 $= 0 + 10i$

2 22-18:41

$U \cdot B \cdot C \cdot D = \sqrt{\frac{8}{2}} + \sqrt{\frac{8}{2}} i$
 $\alpha + bi$
 $\sin \varphi = \frac{b}{\sqrt{a^2+b^2}} = \frac{8}{\sqrt{65}}$
 $\sin \psi = \frac{8}{65}$

2 22-18:49

$|w| > |z| > \frac{1}{2}$
 $|w| \geq |z| > \frac{1}{2}$
 $|z| > \frac{1}{2}$
 $|z| \leq |w|$

 $|z| \geq 1$
 $|z-1| \geq |z|$
 $|\frac{z-1}{z}| \geq 1$

 $|z=0|$
 $|\frac{z-i}{z}| = |\frac{z-i}{z}|$
 $\text{uk. z.a.j.} \geq \text{val } z = 0$

 $|z-a| = |z-b|$
 $\text{rozdelenie } z = a$

 $|z-a| > |z-b|$

2 22-18:52

- $|z| \geq 2$
- $|z+1-i| \leq \sqrt{2}$
- $|z-1-i| \leq \sqrt{2}$

$|z - (-1+i)|$
 $|z - (1+i)| \leq \sqrt{2}$

2i

2 22-19:04

$(a) = (1) + (2) + \dots$
 $(a+b)^n = \sum_{k=0}^n \binom{n}{k} a^k b^{n-k}$

 $\frac{d}{dx} (a+b)^n = (a+b)^{n-1} \cdot (a-b) + \dots$

 $\frac{(a+b)^n}{(a-b)^n} = \dots$

 $(a+b)^n + (a-b)^n = \dots$

 $(a+b)^n \cdot (\cos \frac{\pi}{4} + i \sin \frac{\pi}{4})^n + (a-b)^n \cdot (\cos \frac{\pi}{4} - i \sin \frac{\pi}{4})^n = \dots$

 $(a+b)^n + (a-b)^n = \dots$

 $\frac{(a+b)^n + (a-b)^n}{2} = \dots$

2 22-19:08

$(1+i)^n + (1-i)^n + 2^n = 4 \left(\binom{n}{0} + \binom{n}{4} + \binom{n}{8} + \dots \right)$

 $2 \cdot 2^{\frac{n}{2}} \cdot \cos \frac{\pi n}{4} + 2^n = 4 \left(\binom{n}{0} + \dots \right)$

 $\binom{n}{0} + \binom{n}{4} + \binom{n}{8} + \dots = \frac{1}{4} \left(2 \cdot 2^{\frac{n}{2}} \cdot \cos \frac{\pi n}{4} + 2^n \right)$

2 22-19:25

$x = \sqrt{z}$
 $\frac{x}{z} = \frac{|x|(\cos \varphi + i \sin \varphi)}{|z|(\cos \psi + i \sin \psi)}$
 $x^n = z$
 $|x|^n (\cos n\varphi + i \sin n\varphi) = |z| (\cos \psi + i \sin \psi)$
 $|x| = \sqrt[n]{|z|}$
 $n\varphi = \psi + 2k\pi$
 $\varphi = \frac{\psi + 2k\pi}{n}$

\therefore

$x^2 = 1$
 $x_0 = 1$
 $x_1 = \cos \frac{2\pi}{n} + i \sin \frac{2\pi}{n}$
 $x_2 = \cos \frac{4\pi}{n} + i \sin \frac{4\pi}{n}$
 $x_3 = \cos \frac{6\pi}{n} + i \sin \frac{6\pi}{n}$
 $x_4 = x_2^*$
 $x_5 = x_1^*$
 $x_6 = x_3^*$
 $x_7 = x_4^*$

$1 + x_1^p + (x_1^2)^p + \dots + (x_1^{n-1})^p$
 $q = x_1^p$

n

$n \mid p \Rightarrow p = n \cdot q$

$x_1^p = 1$
 $x_1^{np} = 1$

$\frac{1 - (x_1^p)^{n+1}}{1 - x_1^p} = 0$

2 22-19:27