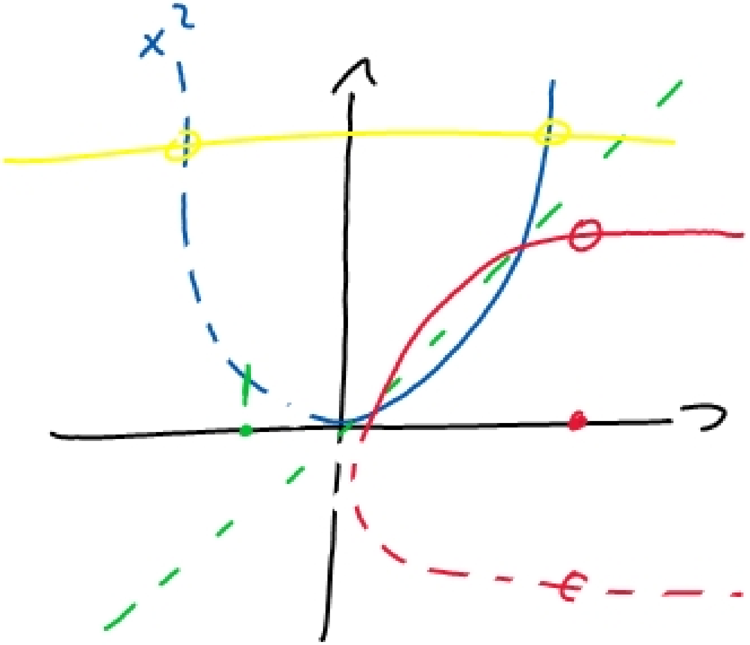


$A = \{(x;y) \in \mathbb{R} \times \mathbb{R} \mid y = x^2\}$

$A^* = \{(x;y) \in \mathbb{R}_0^+ \times \mathbb{R}_0^+ \mid y = x^2\}$

$\downarrow$

$A^{-1} = \{(x;y) \in \mathbb{R}_0^+ \times \mathbb{R}_0^+ \mid y = \sqrt{x}\}$

$\sqrt{3x-4} = 2+x$

$\dots$

$x_1 \; ; \; x_2 \quad \hat{=}$ Prüfung

$+\sqrt{x}$

$4 = x^2$

$x = \pm\sqrt{4} = \pm 2$

$-3-y$

$x - (3 + y) - 4$

$y + (-3 + (-y)) + (-4)$

2011-01 : $A = \{\underline{1}; 2; \underline{3}; 4; 6; 8; 10; 12\}$

$B = \{\underline{1}; \underline{3}; 5; 7; 9; 11; 13\}$

a) $A \cap B = \{1; 3\} = \{x \in \mathbb{N}^{\leq 3} \mid x \bmod 2 <> 0\}$

b) $A \cup B = x \in [1; 13]_{\mathbb{N}}$

c) $A \setminus B = \{x \in \mathbb{N}^{\leq 12} \mid x \bmod 2 = 0\}$

d) $B \setminus A = \{x \in [5; 13]_{\mathbb{N}} \mid x \bmod 2 <> 0\}$

$z = a + bi \; ; \; i = \sqrt{-1}$

$\mathbb{Z}$

$\downarrow$

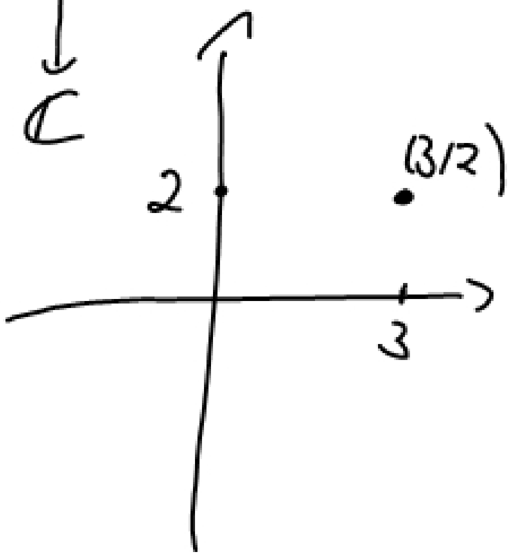
$\mathbb{Q}$

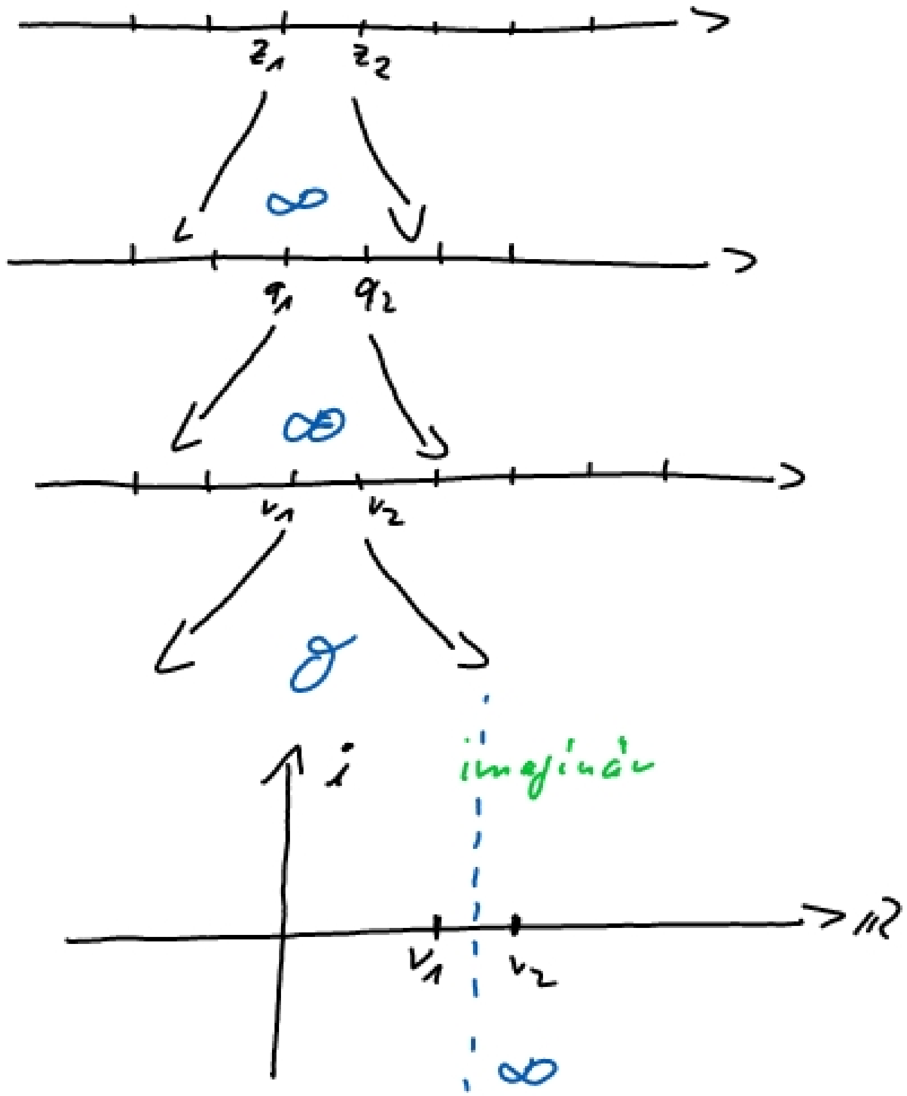
$\downarrow$

$\mathbb{R}$ $\quad z = 3 + 2i$

$\downarrow$

$\mathbb{C}$





$$2\cdot(3i-4)+4\cdot(7i-2)$$

$$6x-8+28x-8=34x-16$$

$$6i-8+28i-8=34i-16$$

$$i=\sqrt{-1}$$

$$i^2=-1$$

$$i^4=i^2\cdot i^2=(-1)\cdot(-1)=1$$

$$-2\cdot(3i-2)\cdot(4-2i)-(2i+3)\cdot 5i$$

$$-2\cdot(12i\underbrace{-6i^2}_{-6\cdot(-1)}-8+4i)-(\underbrace{10i^2}_{10\cdot(-1)}+15i)$$

$$(2i-3)^5$$

$$-2\cdot(-2+16i)-(-10+15i)$$

$$4-32i+10-15i=14-47i$$

$$-2\cdot(3i-1)\cdot 3i(i-1)-2\cdot(3+i)\cdot 2i$$

$$-6i\cdot(3i-1)(i-1)-4i\cdot(3+i)$$

$$-6i(3i^2-3i-i+1)-12i-4i^2$$

$$-6i(-2-4i)-12i+4=12i+24i^2-12i+4=-20$$

$$\frac{3i-2}{\underset{a\,+\,b}{2+i}} \cdot \frac{2-i}{\underset{a\,-\,b}{2-i}} = \frac{(3i-2)(2-i)}{\underset{a^2\,-\,b^2}{2^2-i^2}} = \frac{6i-3i^2-4+2i}{4-(-1)}$$

$$\text{"}\ \frac{3i-2}{r} = \frac{3i}{r} - \frac{2}{r}\ ,\quad r \in \mathbb{R}\ \text{"}$$

$$= \frac{-1+8i}{5} = -\frac{1}{5} - \frac{8}{5}i$$

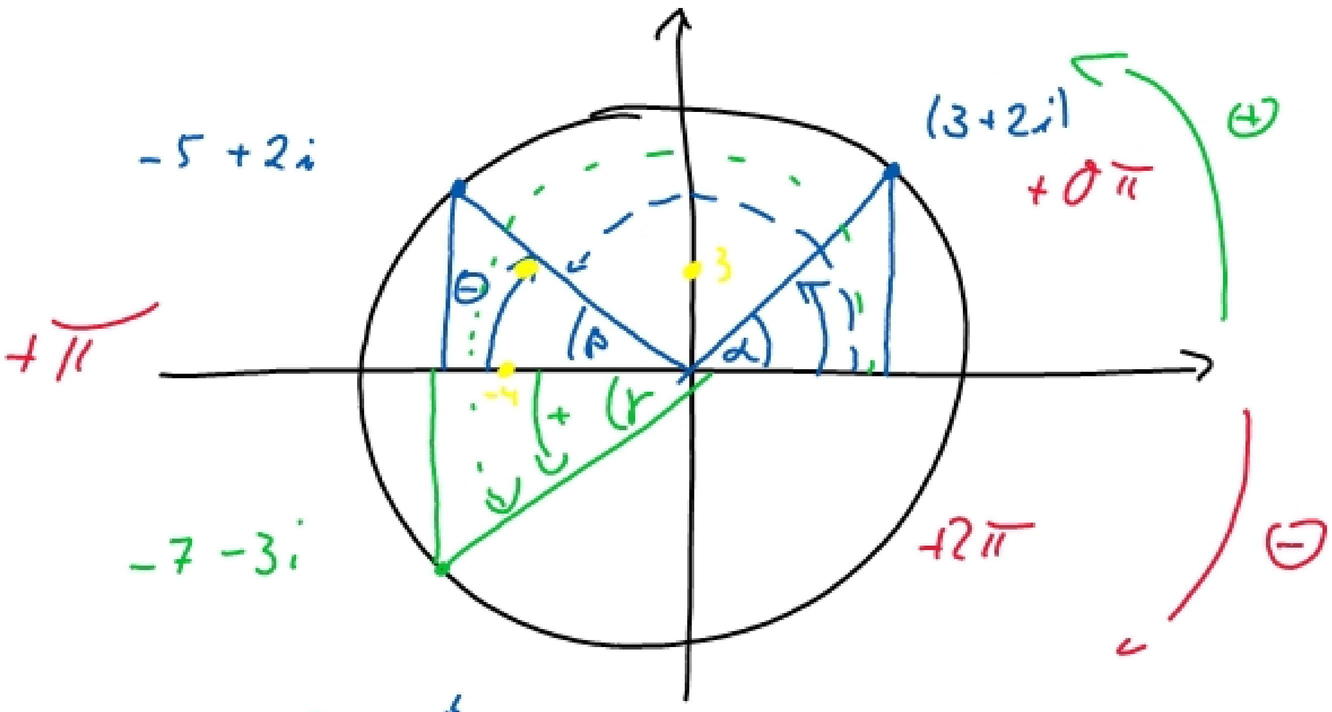
$$= -0{,}2 - 1{,}6i$$

$$(2+i)^2 = 4+4i+i^2 = 3+\underline{\underline{4i}}$$

3. Binom: $(a+b)\cdot(a-b) = a^2 - b^2$

$$\Rightarrow \frac{4-3i}{\underset{a\,-\,b}{3i-1}} \cdot \frac{3i+1}{\underset{a\,+\,b}{3i+1}} = \frac{12i+4-9i^2-3i}{(3i)^2-1^2} = \frac{13+9i}{-10}$$

$$= -1{,}3 - 0{,}9i$$



$$z = \overset{a}{-4} + \overset{b}{3}i$$

$$r = \sqrt{(-4)^2 + 3^2} = \sqrt{25} = 5$$

$$\alpha = \arctan \frac{3}{-4} + \pi$$

$$z = 3 - 2i$$

$$\alpha = \arctan\left(-\frac{2}{3}\right) + 2\pi$$