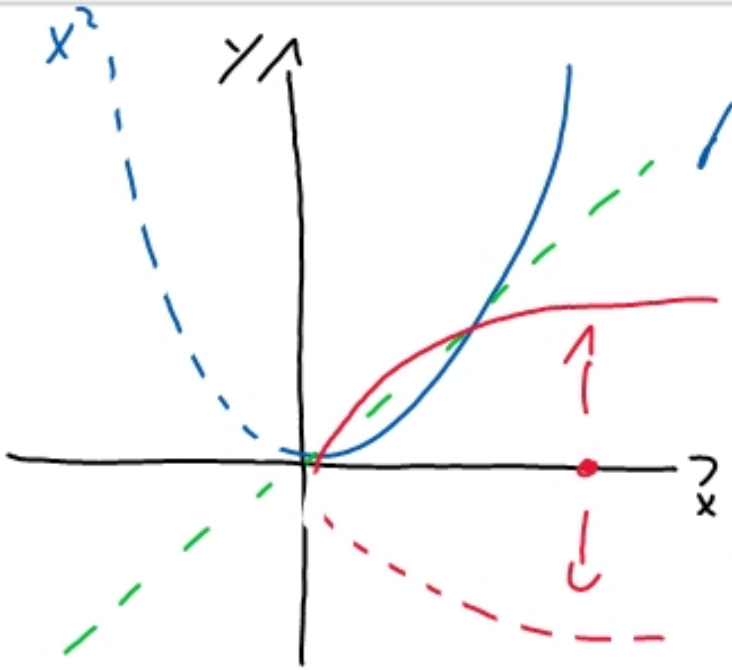


$f(x) = x^2$

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

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

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

$y = +\sqrt{x}$

$\sqrt{3x-1} = 2x+7$

↓

2 Lösung x_1 ; x_2

↓ Probe $\oplus\sqrt{x}$

1 Lösung

$x^2 - 3 = 1 \quad | +3$

$x^2 = 4 \quad | \sqrt{\ }$

$x_{1/2} = \pm\sqrt{4}$

$x_{1/2} = \pm 2$

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

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

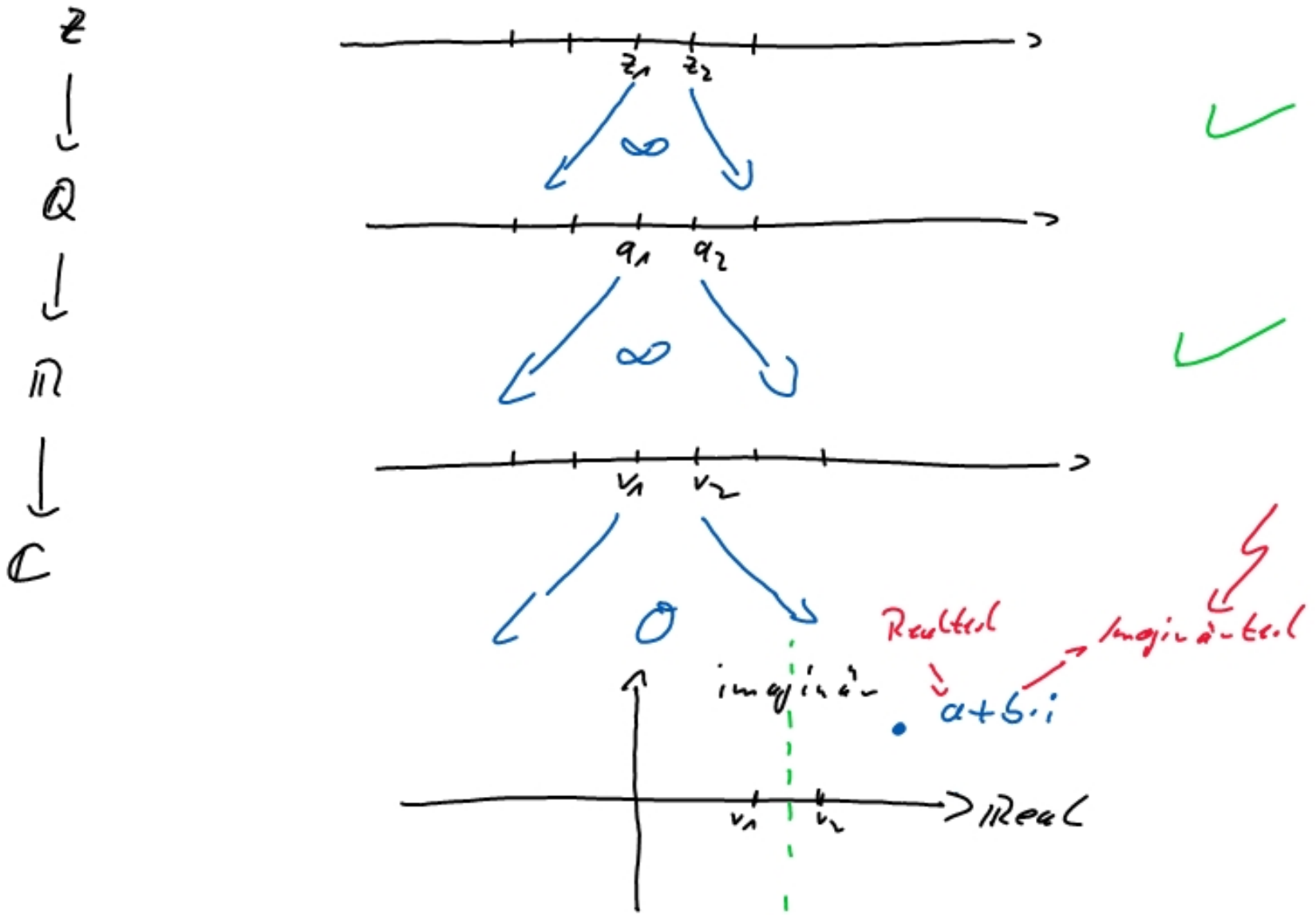
a) $A \cap B = \{1; 3\} = \{x \in \mathbb{N}^{\leq 3} \mid x \bmod 2 \neq 0\}$

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

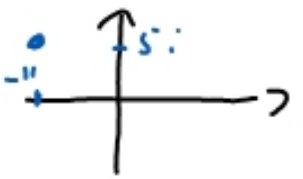
Komplexe Zahlen $z = a + b \cdot i$; $i = \sqrt{-1}$



$i = \sqrt{-1} \Rightarrow i^2 = -1$

1) $(2i - 5) - 3 \cdot (2 - i)$

$2i - 5 - 6 + 3i = -11 + 5i$



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

$-12i^2 + 20i - 2 \cdot (12i - 8i^2 + 6 - 4i)$

$\frac{1}{2} + (-8i - 4) \cdot (-6 + 4i)$ ✓

$-12 \cdot (-1) + 20i - 2 \cdot (8i - 8 \cdot (-1) + 6)$

$12 + 20i - 2 \cdot (8i + 14)$

$12 + 20i - 16i - 28$

$-16 + 4i$

$a + bi$

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

$i^{13} = i^4 \cdot i^4 \cdot i^4 \cdot i^1 = 1 \cdot 1 \cdot 1 \cdot i = i$

3) $-2i \cdot (3i-5)^2 \cdot 2 - 4 \cdot (3i-1) \cdot (-2i) \cdot (4+2i)$

$\alpha \cdot \beta \cdot \gamma \quad \alpha \quad \gamma \quad \delta$

$-4i \cdot (3i-5)(3i-5) + 8i \cdot (3i-1) \cdot (4+2i)$

$-4i \cdot (9i^2 - 15i - 15i + 25) + 8i \cdot (12i + 6i^2 - 4 - 2i)$

-9

$-4i \cdot (16 - 30i) + 8i \cdot (-10 + 10i)$

$-64i + 120i^2 - 80i + 80i^2 = -200 - 144i$

-80

$(2i-3) : (3i+1) = \frac{2i-3}{3i+1} \cdot \frac{3i-1}{3i-1} = \frac{-6 - 2i - 9i + 3}{(3i)^2 - 1}$

$(3i+1)^2 = (3i)^2 + 2 \cdot 3i \cdot 1 + 1^2 = -8 + 6i$

$\frac{-3 - 11i}{-10} = \frac{-3}{-10} + \frac{-11i}{-10}$

$0{,}3 + 1{,}1i$

$(a+b)(a-b) = a^2 - b^2$

$\frac{2\sqrt{x}}{3\sqrt{x}+5}$

$$\frac{4i-2}{4-3i} \cdot \frac{4+3i}{4+3i} = \frac{(4i-2)(4+3i)}{4^2-(3i)^2}$$

$(a-s)$ $(a+s)$

$$= \frac{16i+12i^2-8-6i}{16-(-9)}$$

$$= \frac{-20+10i}{25} = \frac{-20}{25} + \frac{10i}{25}$$

$$= -\frac{4}{5} + \frac{2}{5}i = -0,8+0,4i$$