1) $z = 2 \cdot \frac{5i}{3i-4} - \frac{6i-4}{2-i} + \frac{1}{5} i$ / 2) $\left(2i + \frac{1}{2}\right)^4$

$$\frac{10i}{3i-4} \cdot \frac{3i+4}{3i+4} = \frac{-30+40i}{-9-16} = \frac{-30+40i}{-25} = \frac{6-8i}{5}$$

konjugiert komplexe Zahl

$$\frac{6i-4}{2-i} \cdot \frac{2+i}{2+i} = \frac{12i-8-\overset{6i^2}{6}-4i}{4+1} = \frac{8i-14}{5}$$

$\frac{20}{5} - \frac{15i}{5}$

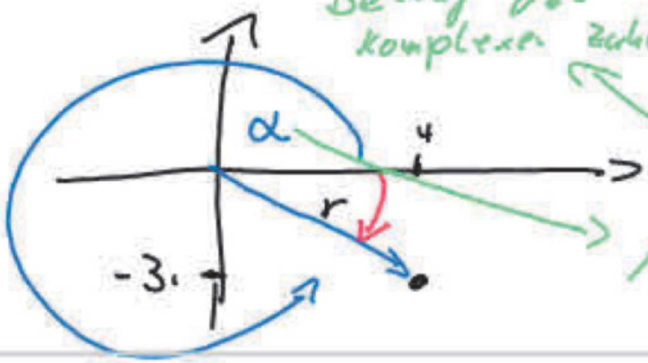
$$z = \frac{6-8i}{5} - \frac{8i-14}{5} + \frac{i}{5} = \frac{6-8i-8i+14+1}{5} = \frac{20-15i}{5}$$

$z = 4 - 3i$

Betrag der komplexen Zahl

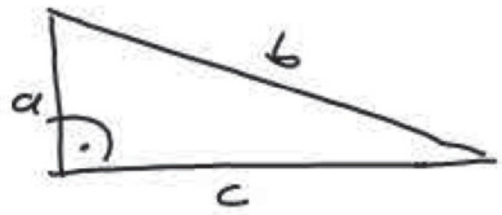
$P(4 \mid -3i)$

$r = \sqrt{4^2+3^2} = 5$

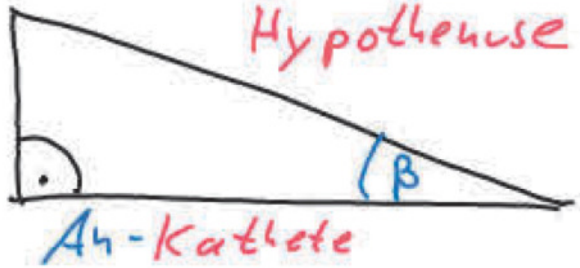


Argument einer komplexen Zahl

Pythagoras : $a^2 + b^2 = c^2$

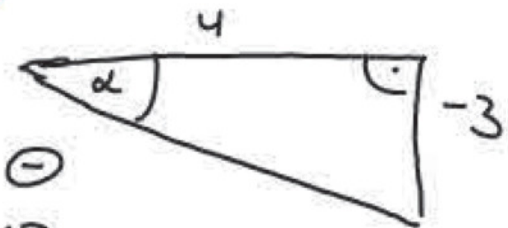


Gegen-Kathete



Die Summe der Kathetenquadrate ist gleich dem Hypothenusenquadrat.

Voraussetzung = Prämisse



$$\tan(\alpha) = \frac{\text{Gegenkathete}}{\text{Ankathete}}$$

mit Uhrzeigersinn ⊖

gegen -"- ⊕

$$\tan(\alpha) = -\tfrac{3}{4}$$

$$\alpha = \text{arc} \tan(-\tfrac{3}{4}) + 2\pi$$

arcus

$(2i + 1/2)^4$

$$\begin{array}{ccccccccc} &&&&1&&&& \\ &&&1&&1&&& \\ &&1&&2&&1&& \\ &1&&3&&3&&1& \\ 1&&4&&6&&4&&1 \end{array}$$

$4 \cdot \frac{2 \cdot 2 \cdot 2}{2}$

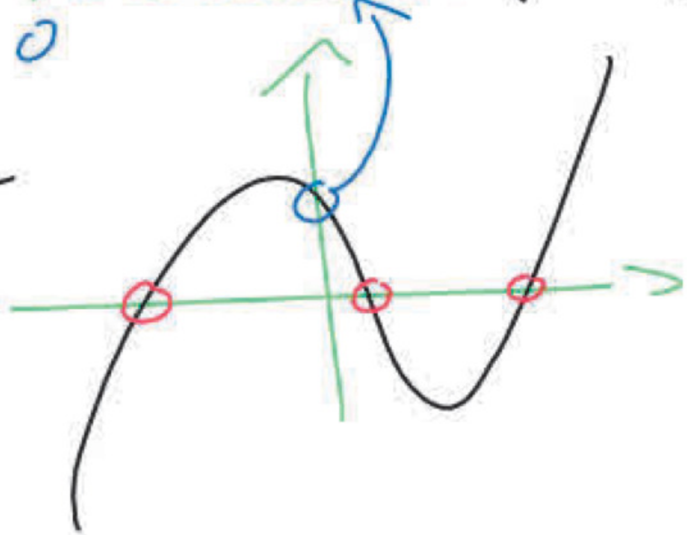
$1(2i)^4 + 4(2i)^3(1/2)^1 + 6(2i)^2(1/2)^2 + 4(2i)^1(\frac{1}{2})^3 + 1(\frac{1}{2})^4$

$16 \quad - 16i \quad - 6 \quad + \quad i + 1/16$

$10\,1/16 - 15i$

Polynom-Division

$f(x) = x^3 + 4x^2 - 7x - 10 = 0$ → Achsenabschnitt $(x=0)$



Nullstellen ? $\quad f(x) = 0$

$M_{TEILER(10)} = \{\pm 1, \pm 2; \pm 5; \pm 10\}$

$x = -1 \quad f(-1) = 0$

$$
\begin{array}{l}
(x^3 + 4x^2 - 7x - 10) : (x+1) = \underbrace{x^2 + 3x - 10}_{(x+5)(x-2)} \\
\underline{-(x^3 + x^2)} \\
\qquad 3x^2 - 7x - 10 \\
\qquad \underline{-(3x^2 + 3x)} \\
\qquad\qquad -10x - 10 \\
\qquad\qquad \underline{-(-10x - 10)} \\
\qquad\qquad\qquad /\quad /
\end{array}
$$

Vieta

$f(x) = \underbrace{(x+1)}_{\text{Linearfaktor}}(x+5)(x-2) = 0$

$\mathbb{L} = \{-5; -1; 2\}$