

## 11.6 Gebrochen lineare Abbildungen

$$f(z) = \frac{\alpha z + \beta}{\gamma z + \delta} \quad \gamma \neq 0 \text{ oder } \delta \neq 0$$

$$\gamma z + \delta \neq 0$$

Lemma  $f = f_3 \circ f_2 \circ f_1$  mit

$$z_1 = f_1(z) = \gamma z + \delta$$

$$z_2 = f_2(z_1) = \frac{1}{z_1}$$

$$z_3 = f_3(z_2) = \frac{\beta\gamma - \alpha\delta}{\gamma} z_2 + \frac{\alpha}{\gamma}$$

$$\gamma \neq 0$$

Bew  $f_3(f_2(f_1(z)))$

$$= \frac{\beta\gamma - \alpha\delta}{\gamma} \frac{1}{\gamma z + \delta} + \frac{\alpha}{\gamma}$$

$$= \frac{1}{\gamma z + \delta} \cdot \frac{1}{\gamma} \left( \beta\gamma - \alpha\delta + \alpha(\gamma z + \delta) \right)$$
$$\beta\gamma + \alpha\gamma z$$