

5.7 Lösungsmenge komplexer Gleichungen

$$\begin{aligned}
 a) \quad z-1 &= \frac{1+i}{2-i} \Leftrightarrow \frac{z-1}{2-2} = (1,1) \left(\frac{2}{2+i}, \frac{1}{2+i} \right) \Leftrightarrow \frac{z-1}{2-2} = (1,-1) \left(\frac{2}{2-i}, \frac{1}{2-i} \right) \Leftrightarrow \frac{z-1}{2-2} = \left(1 \cdot \frac{2}{2-i} - \left(1 \cdot \frac{1}{2-i} \right), 1 \cdot \frac{1}{2-i} + \left(1 \cdot \frac{2}{2-i} \right) \right) \\
 b) \quad \frac{z-1}{2-2} &= \left(\frac{3}{5}, -\frac{1}{5} \right) \Leftrightarrow z-1 = \left(\frac{3}{5} - i \frac{1}{5} \right) (z-2) \Leftrightarrow z-1 = \left(\frac{3}{5} - i \frac{1}{5} \right) z - \left(\frac{6}{5} + i \frac{2}{5} \right) \\
 c) \quad z - z \left(\frac{3}{5} - i \frac{1}{5} \right) &= \left(\frac{6}{5} + i \frac{2}{5} \right) + 1 \Leftrightarrow z \left(1 - \frac{3}{5} + i \frac{1}{5} \right) = 1 - \frac{6}{5} + i \frac{2}{5} \Leftrightarrow z = \left(-\frac{1}{5} + i \frac{1}{5} \right) \left(\frac{3}{5} - i \frac{1}{5} \right)^{-1} \\
 &= \left(-\frac{1}{5} + i \frac{1}{5} \right) \left(\frac{3}{25} + i \frac{1}{25} \right) = \left(-\frac{1}{5} + i \frac{2}{5} \right) (2-i) = \left(-\frac{2}{5} - \frac{1}{5} + i \left(-\frac{1}{5} + \frac{4}{5} \right) \right) = \left(-\frac{3}{5} + i \frac{3}{5} \right)
 \end{aligned}$$