

### Aufgabe 5.60

Berechnen Sie  $\frac{12^{333335}}{(\sqrt{3} + 3i)^{666666}}$  !

**Lösung:**

$|\sqrt{3} + 3i| = \sqrt{3+9} = \sqrt{12}$ ,  $\tan \varphi = \frac{3}{\sqrt{3}} = \sqrt{3}$ ,  $\varphi = \frac{\pi}{3}$ , da I. Quadrant

$$\sqrt{3} + 3i = \sqrt{12} \left( \cos \frac{\pi}{3} + i \sin \frac{\pi}{3} \right)$$

$$\begin{aligned} \frac{12^{333335}}{(\sqrt{3} + 3i)^{666666}} &= \frac{12^{333335}}{\left( \sqrt{12} \left( \cos \frac{\pi}{3} + i \sin \frac{\pi}{3} \right) \right)^{666666}} = \frac{12^{333335}}{12^{333333} (\cos 222222\pi + i \sin 222222\pi)} \\ &= 12^2 = \underline{\underline{144}} \end{aligned}$$