

Opg 2.5

$$\begin{aligned}\cos(\theta_1 + \theta_2) &= \operatorname{Re}\{e^{j(\theta_1 + \theta_2)}\} = \operatorname{Re}\{e^{j\theta_1} \cdot e^{j\theta_2}\} \\ &= \operatorname{Re}\{(\cos \theta_1 + j \sin \theta_1)(\cos \theta_2 + j \sin \theta_2)\} \\ &= \operatorname{Re}\{\cos \theta_1 \cos \theta_2 + \cos \theta_1 j \sin \theta_2 + j \sin \theta_1 \cos \theta_2 - \sin \theta_1 \sin \theta_2\} \\ &= \cos \theta_1 \cos \theta_2 - \sin \theta_1 \sin \theta_2\end{aligned}$$

Analogt:

$$\begin{aligned}\cos(\theta_1 - \theta_2) &= \operatorname{Re}\{e^{j(\theta_1 - \theta_2)}\} = \operatorname{Re}\{e^{j\theta_1} \cdot e^{-j\theta_2}\} \\ &= \operatorname{Re}\{(\cos \theta_1 + j \sin \theta_1)(\cos \theta_2 - j \sin \theta_2)\} \\ &= \operatorname{Re}\{\cos \theta_1 \cos \theta_2 - \cos \theta_1 j \sin \theta_2 + j \sin \theta_1 \cos \theta_2 + \sin \theta_1 \sin \theta_2\} \\ &= \cos \theta_1 \cos \theta_2 + \sin \theta_1 \sin \theta_2\end{aligned}$$