Opg 2.5

$$\cos(\theta_1 + \theta_2) = \mathrm{Re}\{e^{j(\theta_1+\theta_2)}\} = \mathrm{Re}\{e^{j\theta_1} \cdot e^{j\theta_2}\}$$
$$= \mathrm{Re}\{(\cos\theta_1 + j\sin\theta_1)(\cos\theta_2 + j\sin\theta_2)\}$$
$$= \mathrm{Re}\{\cos\theta_1\cos\theta_2 + \cos\theta_1 j\sin\theta_2 + j\sin\theta_1\cos\theta_2 - \sin\theta_1\sin\theta_2\}$$
$$= \cos\theta_1\cos\theta_2 - \sin\theta_1\sin\theta_2$$

Analogt:

$$\cos(\theta_1 - \theta_2) = \mathrm{Re}\{e^{j(\theta_1-\theta_2)}\} = \mathrm{Re}\{e^{j\theta_1} \cdot e^{-j\theta_2}\}$$
$$= \mathrm{Re}\{(\cos\theta_1 + j\sin\theta_1)(\cos\theta_2 - j\sin\theta_2)\}$$
$$= \mathrm{Re}\{\cos\theta_1\cos\theta_2 - \cos\theta_1 j\sin\theta_2 + j\sin\theta_1\cos\theta_2 + \sin\theta_1\sin\theta_2\}$$
$$= \cos\theta_1\cos\theta_2 + \sin\theta_1\sin\theta_2$$