6.29

måndag 19 december 2022 14:04

$$\cos\theta = \frac{e^{i\theta} + e^{-i\theta}}{2}$$

$$\sin\theta = \frac{e^{i\theta} - e^{-i\theta}}{2i}$$

$$\cos\alpha \sin\beta = \left(\frac{e^{i\alpha} + e^{-i\alpha}}{2}\right)\left(\frac{e^{i\beta} - e^{-i\beta}}{2i}\right) = \frac{\left(e^{i\alpha} + e^{-i\alpha}\right)\left(e^{i\beta} - e^{-i\beta}\right)}{4i} =$$

$$= \frac{e^{i(\alpha+\beta)} - e^{i(\alpha-\beta)} + e^{i(\beta-\alpha)} - e^{i(-\alpha-\beta)}}{4i} =$$

$$\frac{e^{is} - e^{-is}}{4i} + \frac{e^{is} - e^{-is}}{4i} = \frac{e^{i(\alpha+\beta)} - e^{-i(\alpha+\beta)} + e^{i(\beta-\alpha)} - e^{-i(\beta-\alpha)}}{4i} =$$

$$= \frac{1}{2}\left(\sin(\alpha+\beta) + \sin(\beta-\alpha)\right)$$

$$\sin(\beta-\alpha) = -\sin(\alpha-\beta)$$