

a) Visa $\sin^3 v = \frac{3\sin v - \sin 3v}{4}$

Vi vet att $\sin v = \frac{e^{iv} - e^{-iv}}{2i}$ så

$$\sin^3 v = \left(\frac{e^{iv} - e^{-iv}}{2i} \right)^3 = \frac{(e^{iv} - e^{-iv})^3}{-8i} \quad \begin{array}{l} \text{mult ut} \\ \downarrow \\ \text{tj\u00e4ren} \end{array}$$

$$= \frac{(e^{iv})^3 - 3(e^{iv})^2 e^{-iv} + 3e^{iv} (e^{-iv})^2 - (e^{-iv})^3}{-8i}$$

$$= \frac{e^{i3v} - 3e^{iv} + 3e^{-iv} - e^{-3iv}}{-8i} \quad \begin{array}{l} \text{gruppera} \\ \downarrow \\ \text{smart} \end{array}$$

$$= \frac{1}{-4} \left(\frac{e^{i3v} - e^{-3iv}}{2} - \frac{3e^{iv} - 3e^{-iv}}{2} \right) =$$

$$= -\frac{1}{4} (\sinh 3v - 3 \sinh v) =$$

$$= \frac{3\sin v - \sin 3v}{4}$$

P.S.S visar cos-identiteten.