

Esercizio PAG 35 n 93

Trasformare in $\operatorname{ctg} \alpha = \frac{\cos \alpha}{\sin \alpha}$

$$\sin^2 \alpha - 2 \sin \alpha \cos \alpha + 2 = \alpha \neq k\pi \quad k \in \mathbb{Z}$$

$$= \sin^2 \alpha - 2 \sin \alpha \cos \alpha + 2 \sin^2 \alpha + 2 \cos^2 \alpha =$$

$$= 3 \sin^2 \alpha - 2 \sin \alpha \cos \alpha + 2 \cos^2 \alpha =$$

$$= \sin^2 \alpha \left(3 - 2 \frac{\cos \alpha}{\sin \alpha} \right) + 2 \cos^2 \alpha =$$

$$= \left(1 - \frac{1}{1 + \operatorname{ctg}^2 \alpha} \right) \left(3 - 2 \operatorname{ctg} \alpha \right) + \frac{2}{1 + \operatorname{ctg}^2 \alpha} =$$

$$= \frac{1 + \operatorname{ctg}^2 \alpha - 1}{1 + \operatorname{ctg}^2 \alpha} \left(3 - 2 \operatorname{ctg} \alpha \right) + \frac{2}{1 + \operatorname{ctg}^2 \alpha} =$$

$$= \frac{3 \operatorname{ctg}^2 \alpha - 2 \operatorname{ctg}^3 \alpha + 2}{1 + \operatorname{ctg}^2 \alpha}$$

$$\operatorname{ctg}^2 \alpha = \frac{\cos^2 \alpha}{1 - \cos^2 \alpha}$$

$$\cos^2 \alpha = (1 - \cos^2 \alpha) \operatorname{ctg}^2 \alpha$$

$$\cos^2 \alpha (1 + \operatorname{ctg}^2 \alpha) = 1$$

$$\cos^2 \alpha = \frac{1}{1 + \operatorname{ctg}^2 \alpha}$$