

Problema 6 (Teorema)

Dimostrare che $\frac{2 \cos 20^\circ + 1}{2 \cos 20^\circ - 1} = \frac{1}{\sqrt{3} \operatorname{tg} 10^\circ}$

SOLUZIONE

$$\frac{2 \cos 20^\circ + 1}{2 \cos 20^\circ - 1} = \frac{\cos 10^\circ}{\sqrt{3} \operatorname{sen} 10^\circ}$$

ed eliminando i denominatori:

$$(2 \cos 20^\circ + 1) \cdot \sqrt{3} \cos 80^\circ = (2 \cos 20^\circ - 1) \cdot \cos 10^\circ$$

$$2\sqrt{3} \cos 20^\circ \cos 80^\circ + \sqrt{3} \cos 80^\circ = 2 \cos 20^\circ \cos 10^\circ - \cos 10^\circ$$

Applicando le formule di Werner:

$$\sqrt{3}(\cos 100^\circ + \cos 60^\circ) + \sqrt{3} \cos 80^\circ = (\cos 30^\circ + \cos 10^\circ) - \cos 10^\circ$$

$$\sqrt{3}(-\cos 80^\circ + \cos 60^\circ) + \sqrt{3} \cos 80^\circ = (\cos 30^\circ + \cos 10^\circ) - \cos 10^\circ$$

$$\sqrt{3} \cos 60^\circ = \cos 30^\circ$$

$$\frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{2}$$

C.V.D.