

Goniometria

Applicazione di alcune formule goniometriche

Provare che risulta

a) $\cos(60^\circ + \alpha) + \sin(30^\circ + \alpha) = \dots = \cos \alpha$

b) $\cos(45^\circ + \alpha)\cos(45^\circ - \alpha) + \sin^2 \alpha = \dots = \frac{1}{2}$

c) $-\sqrt{3}\sin \alpha + \sin\left(\frac{\pi}{2} - \alpha\right) - 2\sqrt{3}\sin\left(\frac{\pi}{3} - \alpha\right) = \dots = -2\cos \alpha$

d) $\frac{\cos(30^\circ + \alpha)}{\cos(30^\circ - \alpha)} - \frac{\operatorname{tg} 30^\circ - \operatorname{tg} \alpha}{\operatorname{tg} 30^\circ + \operatorname{tg} \alpha} = \dots = \frac{2\sin(2\alpha)}{\sqrt{3} + 2\sin(2\alpha)}$

e) $\frac{\sin(30^\circ + \alpha)}{\sin(30^\circ - \alpha)} - \frac{\cotg 30^\circ - \cotg \alpha}{\cotg 30^\circ + \cotg \alpha} = \frac{2(2 - \cos(2\alpha))}{\cos(2\alpha) - 1}$, con $\alpha \neq k\pi, k \in \mathbb{Z}$.

f) $\frac{\sin(\alpha - 30^\circ)}{\sin(\alpha + 30^\circ)} - \frac{\operatorname{tg} \alpha - \operatorname{tg} 30^\circ}{\operatorname{tg} \alpha + \operatorname{tg} 30^\circ} = \dots = \frac{\sqrt{3}\sin \alpha - \cos \alpha}{\sqrt{3}\sin \alpha + \cos \alpha} - \frac{3\sin \alpha - \sqrt{3}\cos \alpha}{3\sin \alpha + \sqrt{3}\cos \alpha} = \dots = 0,$

$$\text{con } \alpha \neq \frac{\pi}{2} + k\pi, k \in \mathbb{Z}$$