

ESERCIZIO N°MATH.IV/"CORSOBASEBLU.MATEMATICA" - B.T.B.O118.156**("FORMULE GONIOMETRICHE DI ADDIZIONE E SOTTRAZIONE")**

Semplifica la seguente espressione:

$$\sin\left(x + \frac{2}{3}\pi\right) - \cos\left(\frac{\pi}{6} + x\right).$$

Svolgimento

$$\sin\left(x + \frac{2}{3}\pi\right) - \cos\left(\frac{\pi}{6} + x\right) \stackrel{=}{\left(\begin{array}{l} \text{Formule di Addizione} \\ \sin(\alpha + \beta) = \sin \alpha \cdot \cos \beta + \cos \alpha \cdot \sin \beta \\ \cos(\alpha + \beta) = \cos \alpha \cdot \cos \beta - \sin \alpha \cdot \sin \beta \end{array} \right)}$$

$$= \left[\sin x \cdot \cos\left(\frac{2}{3}\pi\right) + \cos x \cdot \sin\left(\frac{2}{3}\pi\right) \right] - \left[\cos\left(\frac{\pi}{6}\right) \cdot \cos x - \sin\left(\frac{\pi}{6}\right) \cdot \sin x \right] =$$

$$= \left[\sin x \cdot \cos\left(\frac{2}{3}\pi\right) + \cos x \cdot \sin\left(\frac{2}{3}\pi\right) \right] - \left[\frac{\sqrt{3}}{2} \cdot \cos x - \frac{1}{2} \cdot \sin x \right] =$$

$$= \left[\sin x \cdot \left(-\cos\left(\pi - \frac{\pi}{3}\right)\right) + \cos x \cdot \sin\left(\pi - \frac{\pi}{3}\right) \right] - \left[\frac{\sqrt{3}}{2} \cdot \cos x - \frac{1}{2} \cdot \sin x \right] =$$

$$= [\text{ARCHI ASSOCIATI / Archi Supplementari}] =$$

$$= \left[\sin x \cdot \left(-\cos\left(\frac{\pi}{3}\right)\right) + \cos x \cdot \sin\left(\frac{\pi}{3}\right) \right] - \left[\frac{\sqrt{3}}{2} \cdot \cos x - \frac{1}{2} \cdot \sin x \right] =$$

$$= \left[\sin x \cdot \left(-\frac{1}{2}\right) + \cos x \cdot \frac{\sqrt{3}}{2} \right] - \left[\frac{\sqrt{3}}{2} \cdot \cos x - \frac{1}{2} \cdot \sin x \right] = \cancel{-\frac{1}{2} \cdot \sin x} + \cancel{\frac{\sqrt{3}}{2} \cdot \cos x} - \cancel{\frac{\sqrt{3}}{2} \cdot \cos x} + \cancel{\frac{1}{2} \cdot \sin x} = 0$$