1re

MATHÉMATIQUES

Enseignement de Spécialité

Trigonométrie

Correction

SIMPLIFIER DES EXPRESSIONS ... 4

CORRECTION

1. Simplifions l'expression A:

$$A = \sin\left(5\pi + \frac{\pi}{2}\right) + \sin\left(\frac{\pi}{2} - \frac{3\pi}{4}\right) \times \cos\left(\frac{7\pi}{6}\right)$$

$$= \sin\left(\frac{3\pi}{2}\right) + \cos\left(\frac{3\pi}{4}\right) \times \cos\left(\pi + \frac{\pi}{6}\right) \quad \left(\cos(x) = \sin\left(\frac{\pi}{2} - x\right)\right)$$

$$= -\sin\left(\frac{\pi}{2}\right) + \cos\left(\pi - \frac{\pi}{4}\right) \times \left(-\cos\left(\frac{\pi}{6}\right)\right)$$

$$= -1 - \cos\left(\frac{\pi}{4}\right) \times \left(-\frac{\sqrt{3}}{2}\right)$$

$$= -1 + \left(\frac{\sqrt{2}}{2}\right) \times \left(\frac{\sqrt{3}}{2}\right).$$

Au total: $A = -1 + \frac{\sqrt{6}}{4}.$

2. Simplifions l'expression B:

$$B = \frac{\sin\left(\pi - \frac{\pi}{3}\right)}{\cos\left(\pi - \frac{\pi}{3}\right)} - \frac{\cos\left(\frac{\pi}{4}\right)}{\left(-\sin\left(\frac{\pi}{4}\right)\right)}$$

$\left(\bullet\ \sin\left(\frac{\pi}{2} + x\right) = \cos(x) \quad \bullet\ \cos\left(\frac{\pi}{2} + x\right) = -\sin(x)\right)$

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

$$= \frac{\frac{\sqrt{3}}{2}}{\left(-\frac{1}{2}\right)} + 1$$

$$= -\sqrt{3} + 1.$$

Au total: $B = 1 - \sqrt{3}$.