Cambridge International AS & A Level

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Mathematics 9709/12

Paper 1 Pure Mathematics 1 **October/November 2023**

Question No (2)

2 Find the exact solution of the equation

$$\tfrac{1}{6}\pi + \tan^{-1}(4x) = -\cos^{-1}\left(\tfrac{1}{2}\sqrt{3}\right).$$

Solution:

$$\frac{\pi}{6} + \tan^{-1}(4x) = -\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$$

$$\frac{\pi}{6} + \tan^{-1}(4x) = -\pi/6$$

$$\tan^{-1}(4x) = -\pi/6 - \pi/6$$

$$\tan^{-1}(4x) = -\pi/3$$

$$4x = \tan(-\pi/3)$$

$$4x = -\tan(\pi/3)$$

Know sharing

$\sin(-\theta) = -\sin\theta$

$\cos(-\theta) = \cos\theta$

$\tan(-\theta) = -\tan\theta$

$$4x = -\sqrt{3}$$

$$x = \frac{-\sqrt{3}}{4}$$