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Mathematics

9709/12

Paper 1 Pure Mathematics 1

October/November 2023

Question No (2)

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2 Find the exact solution of the equation

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

Solution:

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

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

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

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

$$4x = \tan\left(-\frac{\pi}{3}\right)$$

$$4x = -\tan\left(\frac{\pi}{3}\right)$$

know sharing

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

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

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

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

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

