Assignment 2 (ICSE Class 12 2018)

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Problem 1 (1. iii)**.** *Solve:* $3\tan^{-1}x + \cot^{-1}x = \pi$.

Solution: The given inverse trigonometric equation is

$$3\tan^{-1}x + \cot^{-1}x = \pi \tag{1}$$

Also, we know the inverse trigonometric identity

$$\tan^{-1}x + \cot^{-1}x = \frac{\pi}{2} \tag{2}$$

Using (2) in (1), we get

$$2\tan^{-1}x = \frac{\pi}{2}, \tag{3}$$

$$\implies \tan^{-1}x = \frac{\pi}{4}, \tag{4}$$

$$\implies x = 1. \tag{5}$$

Therefore x = 1 is the only solution to the equation, as is clear from the graph shown below (The solution is also verified in the C source file `./codes/1_3.c`).

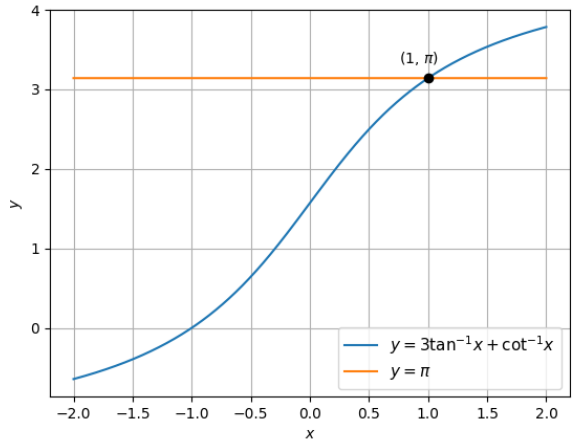

Fig. 1: Graph showing the solution of $3\tan^{-1}x + \cot^{-1}x = \pi$