

# 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

$$3 \tan^{-1} x + \cot^{-1} x = \pi \quad (1)$$

Also, we know the inverse trigonometric identity

$$\tan^{-1} x + \cot^{-1} x = \frac{\pi}{2} \quad (2)$$

Using (2) in (1), we get

$$2 \tan^{-1} x = \frac{\pi}{2}, \quad (3)$$

$$\Rightarrow \tan^{-1} x = \frac{\pi}{4}, \quad (4)$$

$$\Rightarrow x = 1. \quad (5)$$

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`).

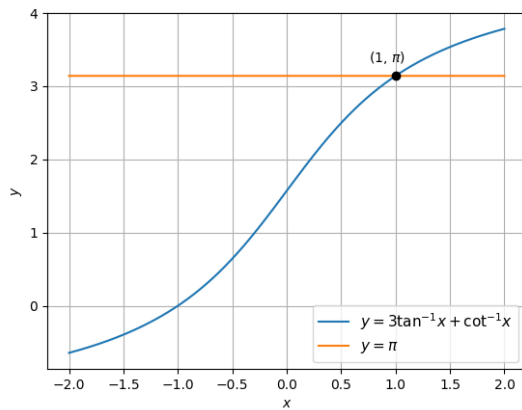


Fig. 1: Graph showing the solution of  $3 \tan^{-1} x + \cot^{-1} x = \pi$