

# AI1110 Assignment 1(Paper 2018)

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## Q4 (c)

Solve  $x^2 + 7x = 7$  and give your answer correct to two decimals.

### Solution

Given,

To Find the roots of  $x^2 + 7x - 7 = 0$ .

We know that for the quadratic equation of form  $ax^2 + bx + c = 0$ , the roots are

$$\frac{-b + \sqrt{b^2 - 4ac}}{2a}, \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

$$\Rightarrow \text{The roots are } \frac{-7 + \sqrt{49 - 4(1)(-7)}}{2(1)}, \frac{-7 - \sqrt{49 - 4(1)(-7)}}{2(1)}$$

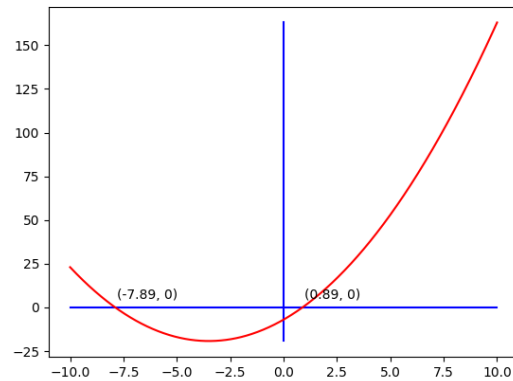
$$\Rightarrow \text{The roots are } \frac{-7 + \sqrt{77}}{2}, \frac{-7 - \sqrt{77}}{2}$$

$$\Rightarrow \text{The roots are } \frac{-7 + 8.7749}{2}, \frac{-7 - 8.7749}{2}$$

( $\sqrt{77}$  can be found by long division method up to four decimals)

$\Rightarrow$  The roots are -7.8874, 0.8874

On rounding them off to 2 decimal places we get the roots as -7.89 and 0.89.



**Figure :** Plot of  $x^2 + 7x - 7 = 0$  (Red) and Blue lines are considered as axes

$\therefore$  The solutions of  $x^2 + 7x = 7$  are  $x = -7.89$  and  $x = 0.89$ .