Assignment 1

JARPULA BHANU PRASAD - AI21BTECH11015

Download codes from:

Python code for graph - python.
And c-code for roots - c-code.
And latex code from - Latex.

I. PROBLEM-ICSE-2019-10 Q)4-B

Q)Solve for x the quadratic equation

$$x^2 - 4x - 8 = 0.$$

Give your answer correct to three significant figures.

II. SOLUTION

Given quadratic equation,

$$x^2 - 4x - 8 = 0. \tag{1}$$

Solution for the quadratic equation is the form

$$ax^2 + bx + c = 0. \tag{2}$$

is given by

$$\boxed{\frac{-b \pm \sqrt{b^2-4ac}}{2a}} \tag{3}$$

let α and β be the roots of the equation, Such that,

$$\boxed{\alpha = \frac{-b+\sqrt{b^2-4ac}}{2a} \text{ and } \beta = \frac{-b-\sqrt{b^2-4ac}}{2a}} \tag{4}$$

Now, on comparing the coefficients from eqn(1) and eqn(2).
a=1,b=-4 and c=-8.
Substituting values in eqn(4). we get,

$$\alpha = \frac{-(-4)+\sqrt{(-4)^2-4(1)(-8)}}{2(1)}$$

and

$$\beta = \frac{-(-4)-\sqrt{(-4)^2-4(1)(-8)}}{2(1)}$$

On simplifying we get,

$$\alpha = 2+2\sqrt{3} \text{ and } \beta = 2-2\sqrt{3}$$

i.e., The roots of the equation are,

$$\alpha = 5.464 \text{ and } \beta = -1.464$$

On rounding off to three significant figures. The roots of the equation are,

$$\boxed{\alpha = 5.46 \text{ and } \beta = -1.46.}$$

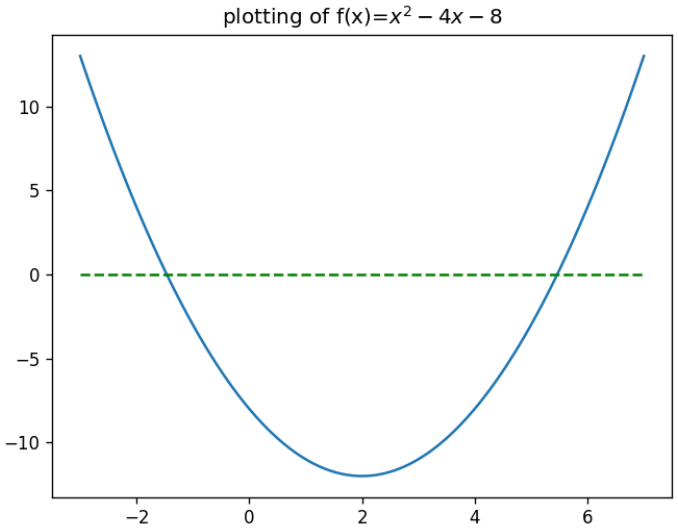

Fig. 1. Roots of the equation

The above graph gives the roots of the equation