

Assignment 1

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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,

$$x^2 - 4x - 8 = 0. \quad (1)$$

Solution for the quadratic equation is the form

$$ax^2 + bx + c = 0. \quad (2)$$

is given by

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad (3)$$

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

$$\alpha = \frac{-b + \sqrt{b^2 - 4ac}}{2a} \text{ and } \beta = \frac{-b - \sqrt{b^2 - 4ac}}{2a} \quad (4)$$

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,

$$\alpha = \frac{-(-4) + \sqrt{(-4)^2 - 4(1)(-8)}}{2(1)} \quad (5)$$

and

$$\beta = \frac{-(-4) - \sqrt{(-4)^2 - 4(1)(-8)}}{2(1)} \quad (6)$$

On simplifying (5) and (6) we get,

$$\alpha = 2 + 2\sqrt{3} \quad (7)$$

$$\beta = 2 - 2\sqrt{3} \quad (8)$$

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

$$\alpha = 5.464 \quad (9)$$

$$\beta = -1.464 \quad (10)$$

On rounding off to three significant figures.

The roots of the equation are,

$$\alpha=5.46 \text{ and } \beta=-1.46. \quad (11)$$

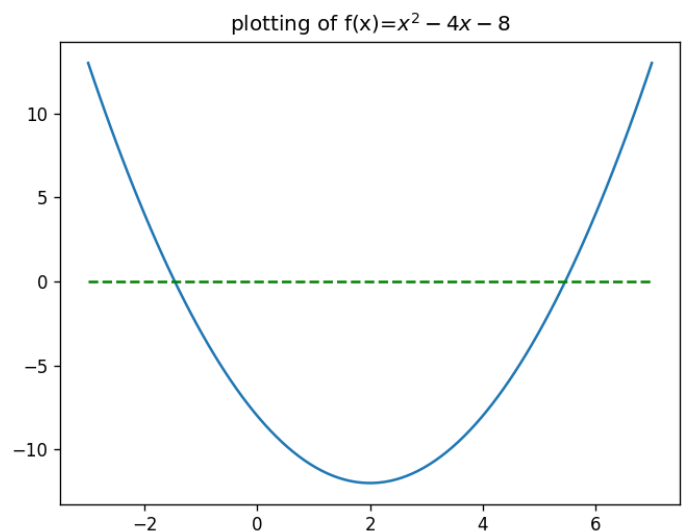


Fig. 1. graph 1:Roots of the equation

The above graph 1 gives the roots of the equation