Assignment-05

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Download all python codes from

https://github.com/Chandragirisaiteja/Assignment5.git

and latex-tikz codes from

https://github.com/Chandragirisaiteja/Assignment5.git

Question taken from

https://github.com/gadepall/ncert/blob/main/linalg/quadratic_forms/gvv_ncert_quadratic_forms.pdf

1 QUAD

Find the roots of the following quadratic equation

$$2x^2 - 6x + 3 = 0 \tag{1.0.1}$$

2 SOLUTION

1) $2x^2 - 6x + 3 = 0$ can be expressed as

$$\mathbf{x}^T \begin{pmatrix} 2 & 0 \\ 0 & 0 \end{pmatrix} \mathbf{x} + \begin{pmatrix} -6 & 0 \end{pmatrix} \mathbf{x} + 3 = 0 \tag{2.0.1}$$

If $\begin{pmatrix} k \\ 0 \end{pmatrix}$ satisfies (2.0.1) then k is the root of the equation (2.0.1).
From graph, the roots are the points where the quadratic equation cuts the x-axis. A quadratic equation can have a maximum of two distinct roots.

$$2k^2 - 6k + 3 = 0 \tag{2.0.2}$$

$$(k-3)(2k-1) = 0 \tag{2.0.3}$$

From the graph in 1, the roots are 3 and $\frac{3}{2}$.

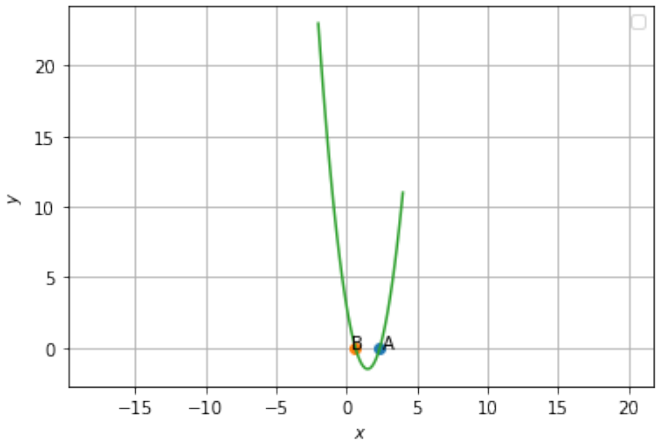

Fig. 1: Roots of $2x^2 - 6x + 3 = 0$