ASSIGNMENT 6

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Download all python codes from

https://github.com/ponnaboinakalpana12/Assignment6/Assignment6.py

and latex-tikz codes from

https://github.com/ponnaboinakalpana12/Assignment6//Assignment6.tex

1 Question No 2.16(Quad forms)

Factorise $6x^2 + 17x + 5$.

2 SOLUTION

1) The given polynomial can be expressed as:

$$\mathbf{x}^T \begin{pmatrix} 6 & 0 \\ 0 & 0 \end{pmatrix} \mathbf{x} + \begin{pmatrix} 17 & 0 \end{pmatrix} \mathbf{x} + 5 = 0 \tag{2.0.1}$$

Substitute y=0 in the above equation

$$6x^2 + 17x + 5 = 0 \tag{2.0.2}$$

$$6x^2 + 2x + 15x + 5 = 0 \tag{2.0.3}$$

$$(3x + 1)(2x + 5) = 0 \tag{2.0.4}$$

$$\implies x = \frac{-1}{3}, \frac{-5}{2} \tag{2.0.5}$$

$$\therefore (3x + 1)(2x + 5) = 6x^2 + 17x + 5 \tag{2.0.6}$$

Hence (3x+1) and (2x+5) are the factors.
Plot the graph:

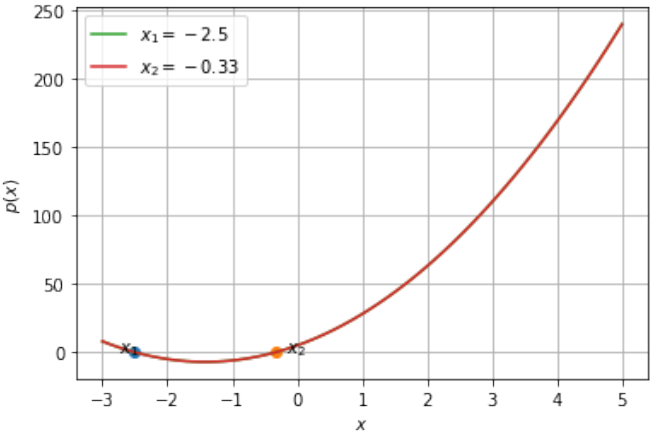

Fig. 2.1: Graph of $6x^2 + 17x + 5$.