ASSIGNMENT 6

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1 QUESTION NO 2.16(QUAD FORMS)

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

2 SOLUTION

1) The given polynomial can be expressed as:

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

Substitute y=0 in the above equation

$$6x^2 + 17x + 5 = 0 \qquad (2.0.2)$$
$$6x^2 + 2x + 15x + 5 = 0 \qquad (2.0.3)$$
$$(3x + 1)(2x + 5) = 0 \qquad (2.0.4)$$
$$\implies x = \frac{-1}{3}, \frac{-5}{2} \qquad (2.0.5)$$
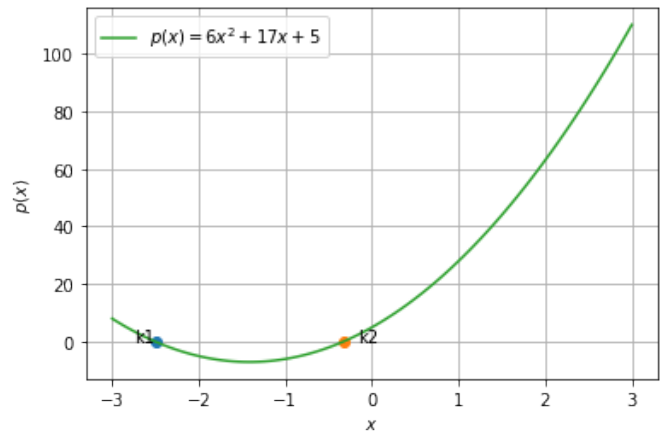$$\therefore (3x + 1)(2x + 5) = 6x^2 + 17x + 5 \qquad (2.0.6)$$

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

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