Quiz 4

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***Abstract*—This document contains the solution of the question from NCERT 12th standard chapter 10 exercise 10.2 problem 5**

1 Exercise 10.2

1) Find the scalar and the vector component of the vector with initial point (2,1) and terminal point (-5,7).
Let the initial point be denoted by,

$$\mathbf{I} = \begin{pmatrix} 2 \\ 1 \end{pmatrix} \tag{1.0.1}$$

and the terminal point be denoted by,

$$\mathbf{T} = \begin{pmatrix} -5 \\ 7 \end{pmatrix} \tag{1.0.2}$$

The vector joining the two points is,

$$\mathbf{T} - \mathbf{I} = \begin{pmatrix} -5 \\ 7 \end{pmatrix} - \begin{pmatrix} 2 \\ 1 \end{pmatrix} = \begin{pmatrix} -7 \\ 6 \end{pmatrix} \tag{1.0.3}$$

The scalar component of the vector is,

$$\|\mathbf{T} - \mathbf{I}\| = \sqrt{(-7)^2 + 6^2} = \sqrt{85} \tag{1.0.4}$$

The vector component of the vector is,

$$\mathbf{T} - \mathbf{I} = \begin{pmatrix} -7 \\ 6 \end{pmatrix} \tag{1.0.5}$$