

1-1.9-22

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VECTOR ARITHMETIC(CBSE)

Question(1.9.22)Find the value of y for which the distance between the points \mathbf{P} $(2, -3)$ and \mathbf{Q} $(10, y)$ is 10 units.

Solution:

Parameter	Description
P	$\begin{pmatrix} 2 \\ -3 \end{pmatrix}$
Q	$\begin{pmatrix} 10 \\ y \end{pmatrix}$
D	$Q - P$

TABLE 0: Parameters Used

$$\|D\| = 10 \quad (0.1)$$

$$\Rightarrow DD^T = 10^2 \quad (0.2)$$

$$= \begin{pmatrix} 8 & y+3 \end{pmatrix} \begin{pmatrix} 8 \\ y+3 \end{pmatrix} \quad (0.3)$$

$$100 = 73 + y^2 + 6y \quad (0.4)$$

$$\therefore y = 3, -9 \quad (0.5)$$

