1.9.16

EE24BTECH11008 - Aslin Garvasis

Question:
Find the distance between the points (a, b) and $(-a, -b)$
Solution:

Variable	Description
$\mathbf{A}(a, b) = (8, 9)$	coordinates of first point
$\mathbf{B}(-a, -b) = (-8, -9)$	coordinates of second point
$(\mathbf{A}-\mathbf{B})^{\mathbf{T}}(\mathbf{A}-\mathbf{B}) = \|\|\mathbf{A}-\mathbf{B}\|\|^2$	square of distance between $\mathbf{A}$ and $\mathbf{B}$
d	distance between $\mathbf{A}$ and $\mathbf{B}$

TABLE 0: Input parameters

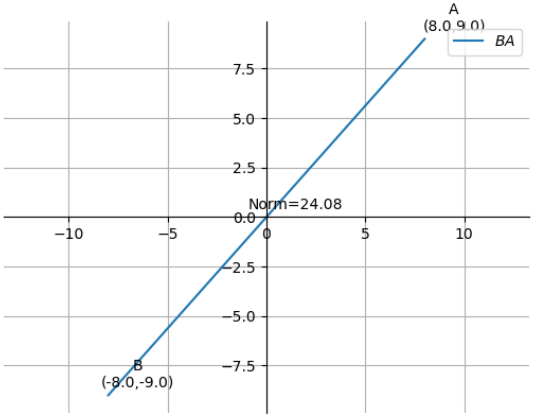
$$\implies d = \|\mathbf{A}-\mathbf{B}\| = \sqrt{(\mathbf{A}-\mathbf{B})^T(\mathbf{A}-\mathbf{B})} \tag{0.1}$$

$$\implies d = \sqrt{\begin{pmatrix}2a & 2b\end{pmatrix}\begin{pmatrix}2a\\2b\end{pmatrix}} \tag{0.2}$$

$$\implies d = \sqrt{4a^2+4b^2} \tag{0.3}$$

$$\implies d = 2\sqrt{a^2+b^2} \tag{0.4}$$

$$\implies d = 2\sqrt{145} \tag{0.5}$$


A
(8.0,9.0)
BA
7.5
5.0
2.5
Norm=24.08
0.0
−10
−5
0
5
10
−2.5
−5.0
−7.5
B
(-8.0,-9.0)