

1.9.34

EE25BTECH11018 - Darisy Sreetej

4th September, 2025

# Question

Find the distance of the point  $(-6, 8)$  from the origin.

# Equation

The distance of the point from the origin is the length of its position vector  $\mathbf{P}$ . The formula is given as

$$\|\mathbf{P}\| = \sqrt{\mathbf{P}^T \mathbf{P}} \quad (1)$$

$$\mathbf{P}^T = \begin{pmatrix} -6 & 8 \end{pmatrix}$$

From ??, we have

$$\mathbf{P}^T \mathbf{P} = \begin{pmatrix} -6 & 8 \end{pmatrix} \begin{pmatrix} -6 \\ 8 \end{pmatrix} \quad (2)$$

$$= (-6)(-6) + (8)(8) \quad (3)$$

$$= 36 + 64 \quad (4)$$

$$= 100 \quad (5)$$

# Solution

$$\text{Distance} = \|\mathbf{P}\| = \sqrt{\mathbf{P}^\top \mathbf{P}} = \sqrt{100} = 10$$

∴ The distance of the point  $(-6, 8)$  from the origin is **10 units**.

# Plot-Graph

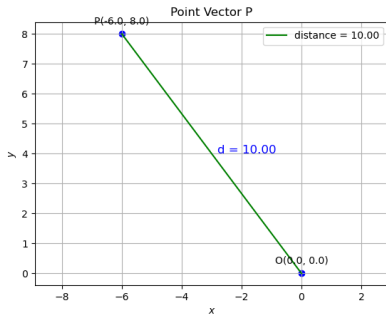


Figure: Point  $P(-6, 8)$