

VECTORS

1 12th Maths - EXERCISE-10.4

1. Given that $\vec{a} \cdot \vec{b} = 0$ and $\vec{a} \times \vec{b} = 0$. What can you conclude about the vectors \vec{a} and \vec{b} .

Solution: Given

(a) $\mathbf{a}^T \mathbf{b} = 0$

i. either $\|\mathbf{a}\| = 0$ or $\|\mathbf{b}\| = 0$, or $\mathbf{a} \perp \mathbf{b}$.

(b) $\mathbf{a} \times \mathbf{b} = 0$

i. either $\|\mathbf{a}\| = 0$ or $\|\mathbf{b}\| = 0$, or $\mathbf{a} \parallel \mathbf{b}$.

But, \mathbf{a} and \mathbf{b} cannot be perpendicular and parallel simultaneously.
Hence, $\|\mathbf{a}\| = 0$ or $\|\mathbf{b}\| = 0$.