

Vector Algebra

19-01-2025

(a) Vector Physical Quantity:

Any term or word can be a vector Physical Quantity if (a) It must express at least

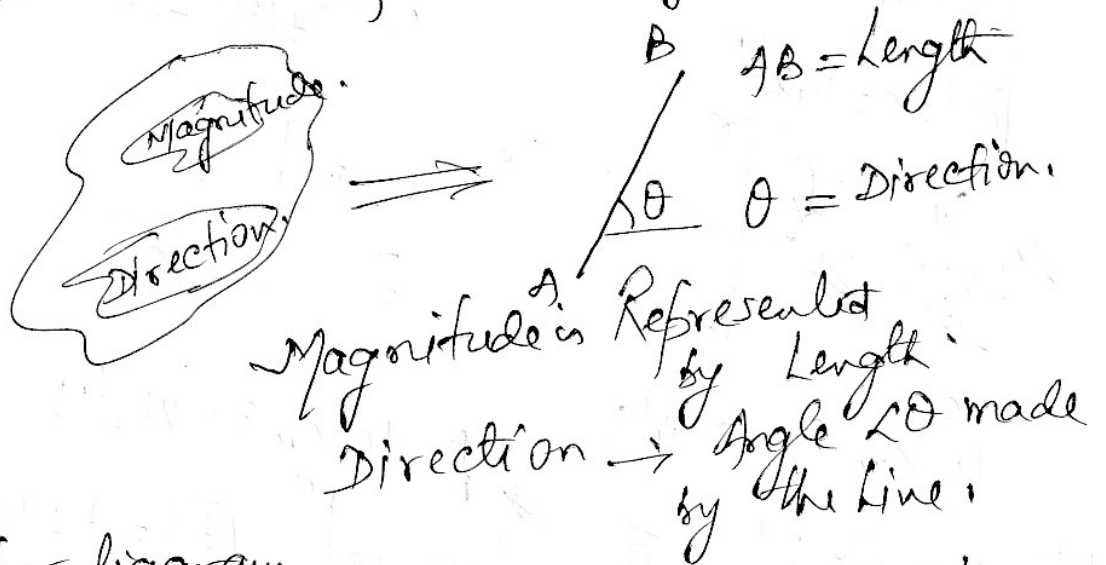
One property or One behaviour of the body.

(b) It must be measurable.

(c) It must have Concept of Magnitude and Sense of direction.

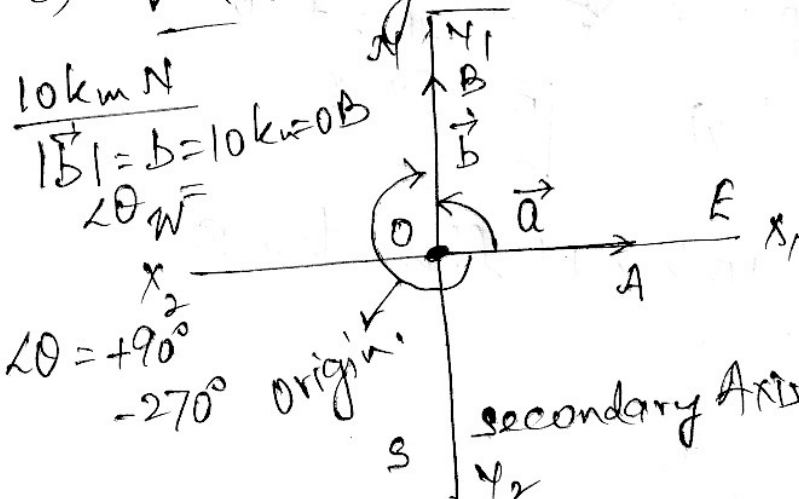
(d) It must obey a special law of addition.

(b) Representation of vector Physical Quantity:



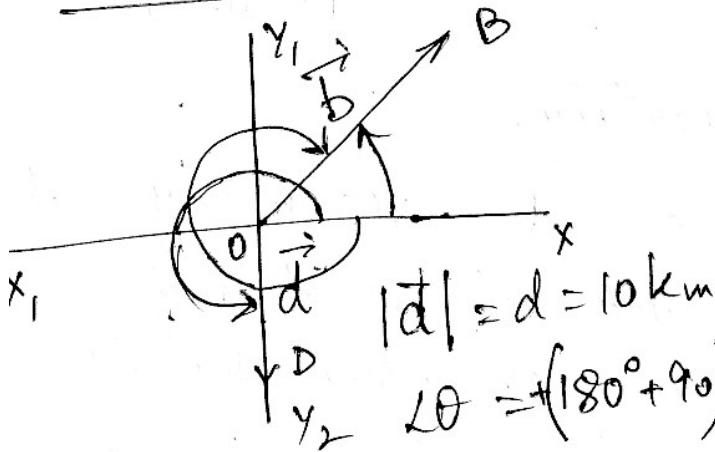
Scale - 1cm - 1km

(c) Vector diagram



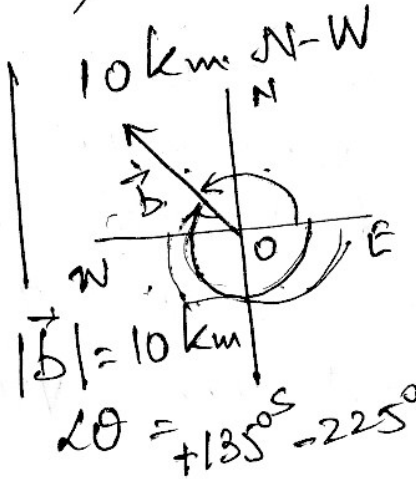
10 km S

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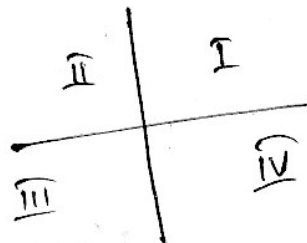
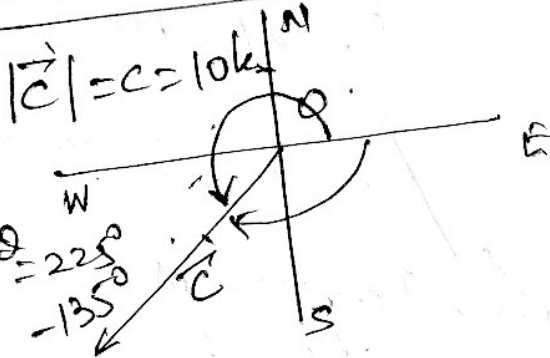


10 km N-E

$|\vec{b}| = OB = b$
 $\angle \theta = +45^\circ, -315^\circ$

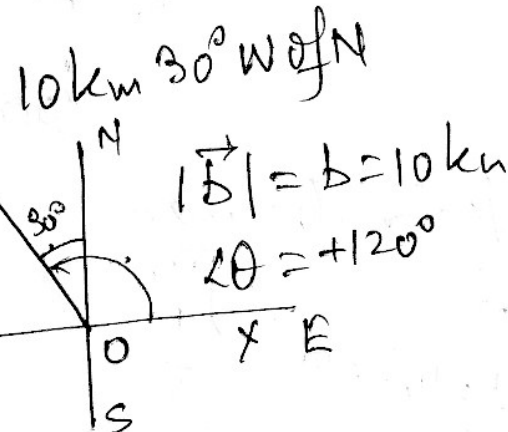


10 km S-W



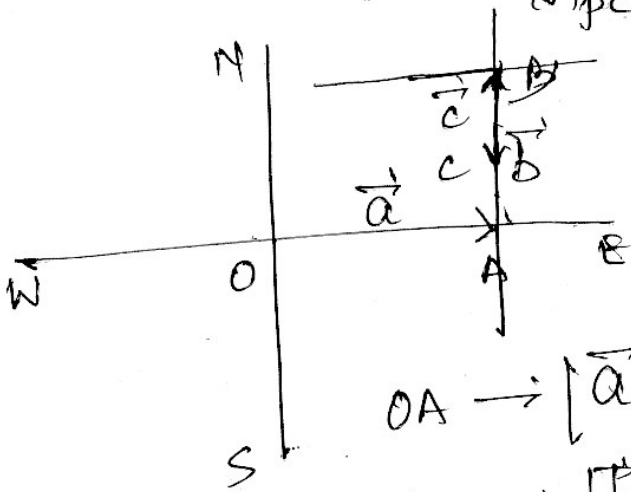
10 km 30° N of E

$|\vec{a}| = OA = 10 \text{ km}$
 $\angle \theta = +30^\circ, -330^\circ$



10 km E then 10 km N then 5 km S

19-01-2025



$$OA \rightarrow |\vec{a}| = 10 \text{ km } \hat{S}$$

$$AB \rightarrow |\vec{b}| = 10 \text{ km } \hat{NE}$$

$$|BC| \rightarrow |\vec{c}| = 5 \text{ km } \hat{S}$$

$$|\vec{a}| = a = 10 \text{ km} \quad | \vec{b} | = 10 \text{ km} \quad | \vec{c} | = 5 \text{ km}$$

$$\angle \theta_1 = 0^\circ \quad \angle \theta_2 = +90^\circ \quad \angle \theta_3 = -90^\circ$$