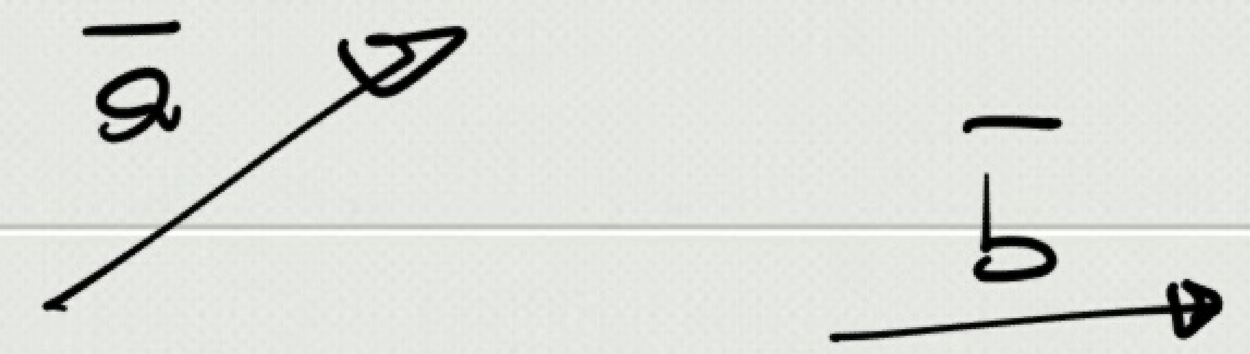
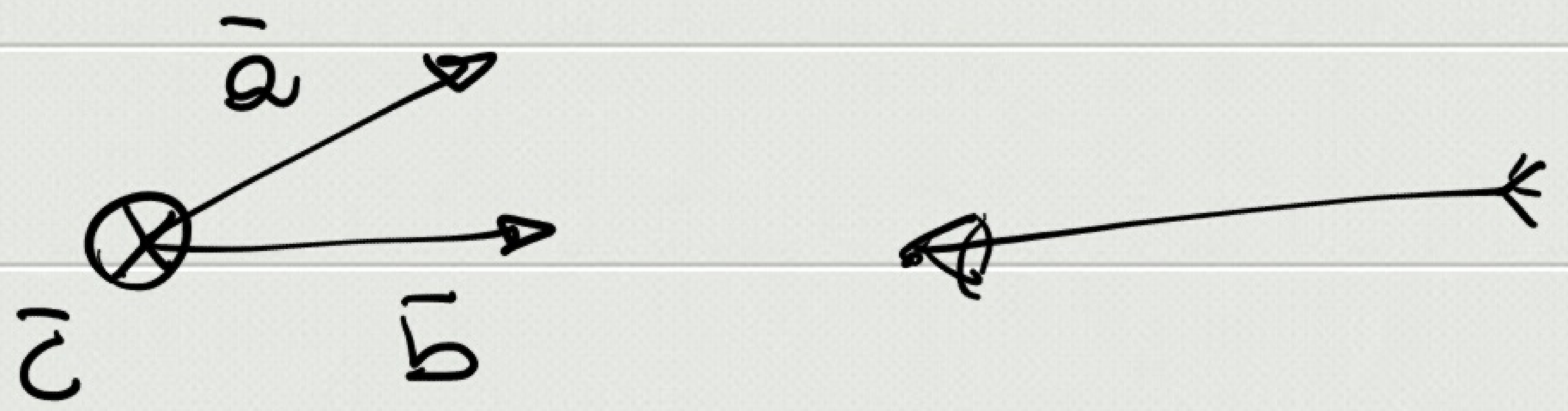
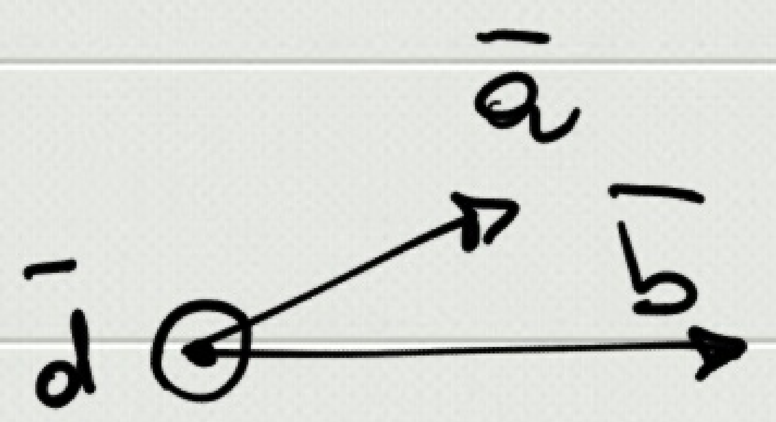
$$\boxed{\bar{a} \times \bar{b} = \bar{c}}$$

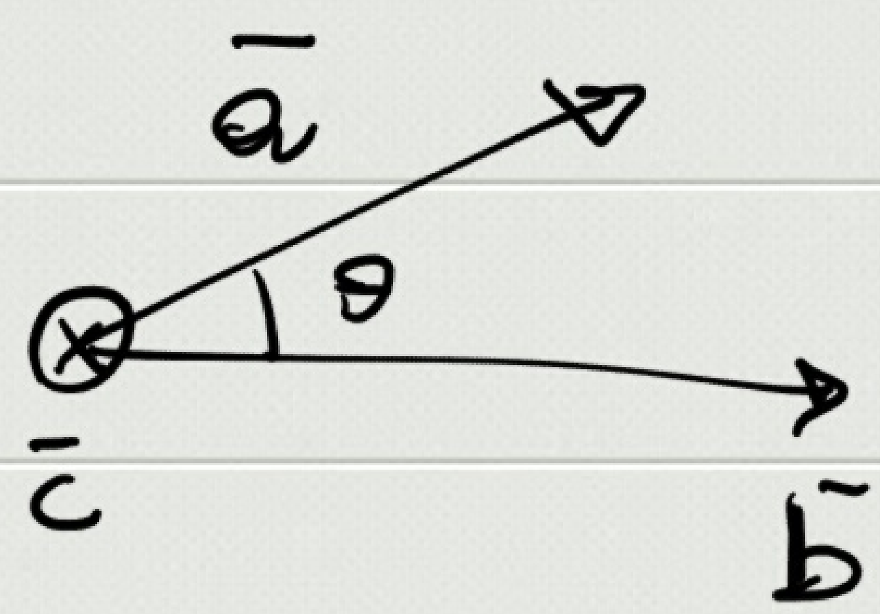




$$\bar{b} \times \bar{a} = \bar{d}$$

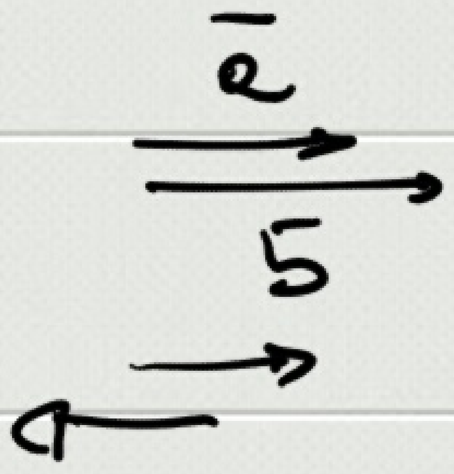


$$\boxed{c = ab\sin\theta}$$



- $\bar{a} \times \bar{b} = - \bar{b} \times \bar{a}$

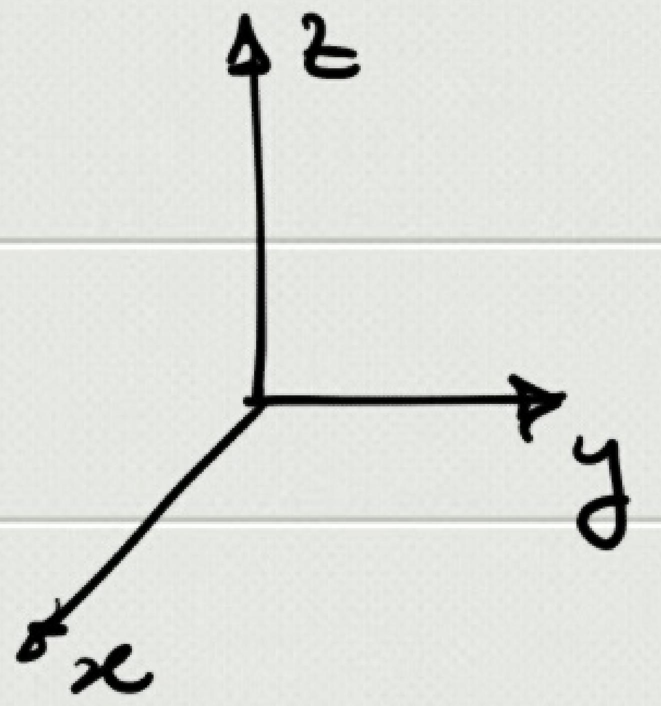
- $\bar{a} \times \bar{b} = 0 \quad \begin{cases} a, b = 0 \\ \sin\theta = 0 \Rightarrow \theta = 0, \pi \end{cases}$



- $\bar{a} \times (\bar{b} + \bar{c}) = \bar{a} \times \bar{b} + \bar{a} \times \bar{c}$

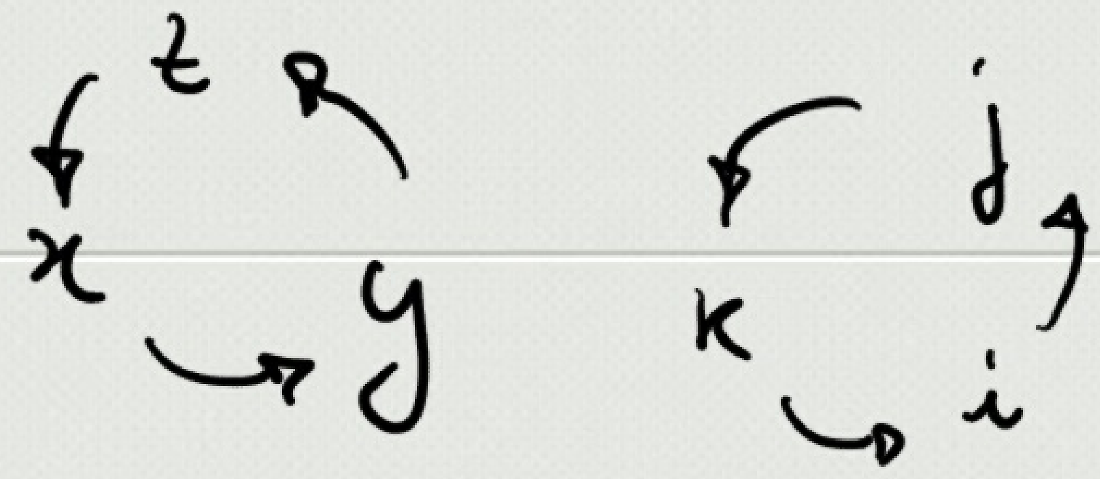
- $(\bar{a} \times \bar{b}) \times \bar{c} \neq \bar{a} \times (\bar{b} \times \bar{c})$

- $\bar{u}_i \times \bar{u}_j = \begin{cases} 0 & i = j \\ \pm \bar{u}_k & i \neq j \end{cases}$



$\bar{u}_x \times \bar{u}_y = \bar{u}_z$

$\boxed{\bar{u}_i \times \bar{u}_j = \bar{u}_k} \longrightarrow$



$$\bar{c} = \bar{a} \times \bar{b} = (a_x \bar{u}_x + a_y \hat{u}_y + a_z \bar{u}_z) \times (b_x \bar{u}_x + b_y \bar{u}_y + b_z \bar{u}_z) =$$

$$= a_x b_y \bar{u}_z + a_x b_z (-\bar{u}_y) + a_y b_x (-\bar{u}_z) + a_y b_z \bar{u}_x +$$

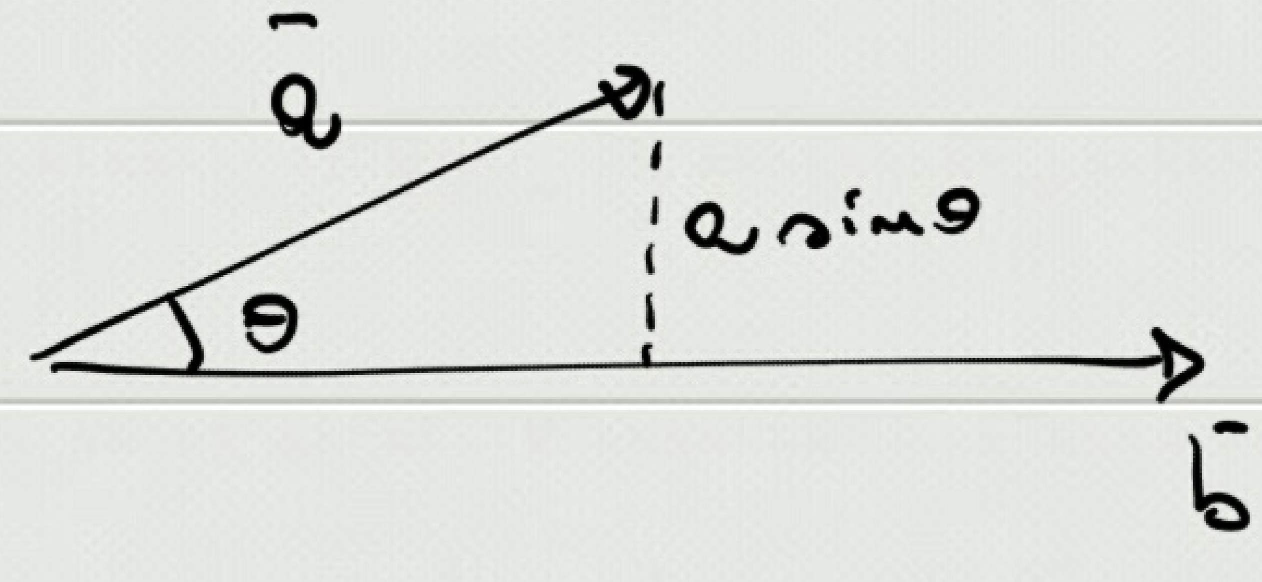
$$+ a_z b_x \bar{u}_y + a_z b_y (-\bar{u}_x) =$$

$$= (a_y b_z - a_z b_y)\bar{u}_x + (a_z b_x - a_x b_z)\bar{u}_y + (a_x b_y - a_y b_x)\bar{u}_z =$$

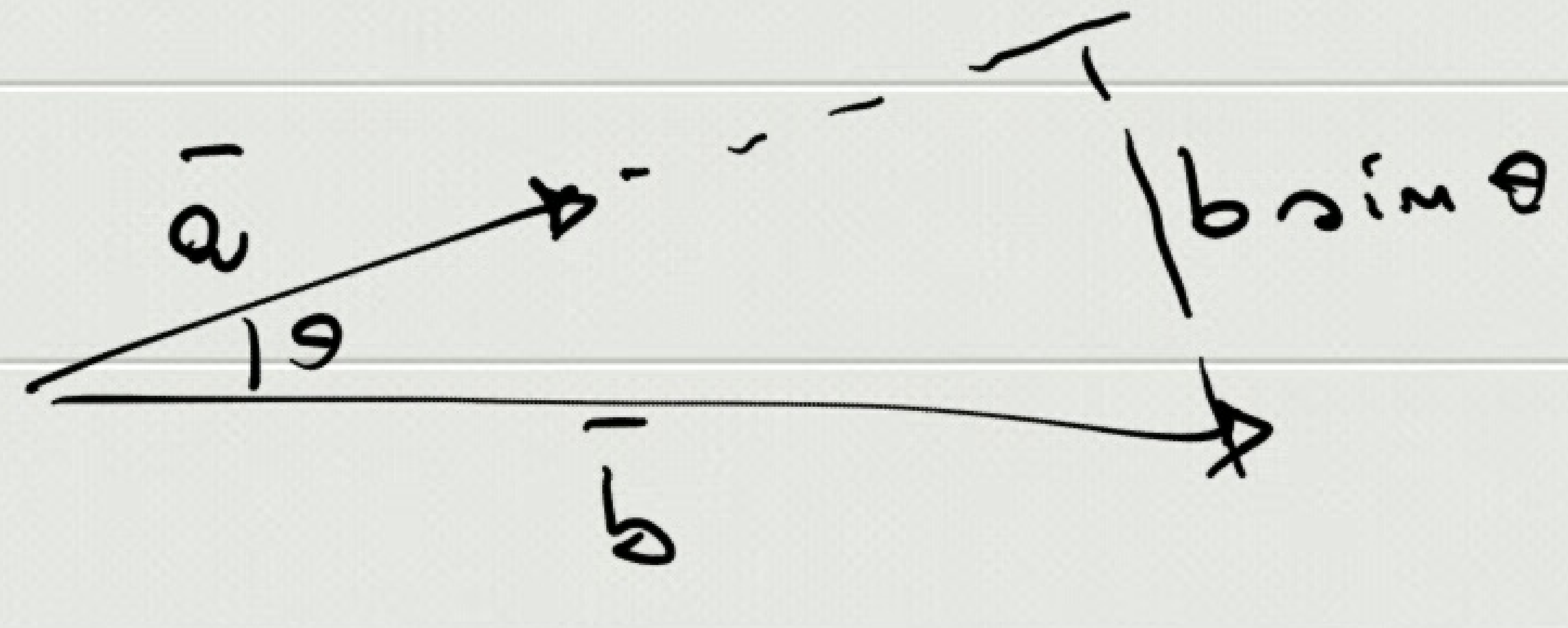
$$= \begin{vmatrix} \bar{u}_x & \bar{u}_y & \bar{u}_z \\ a_x & a_y & a_z \\ b_x & b_y & b_z \end{vmatrix}$$

$$\bar{a} \times \bar{b} = \bar{c}$$

$$c = a b \sin\theta$$



$$= (a \sin\theta) b$$



$$c = a (b \sin\theta)$$