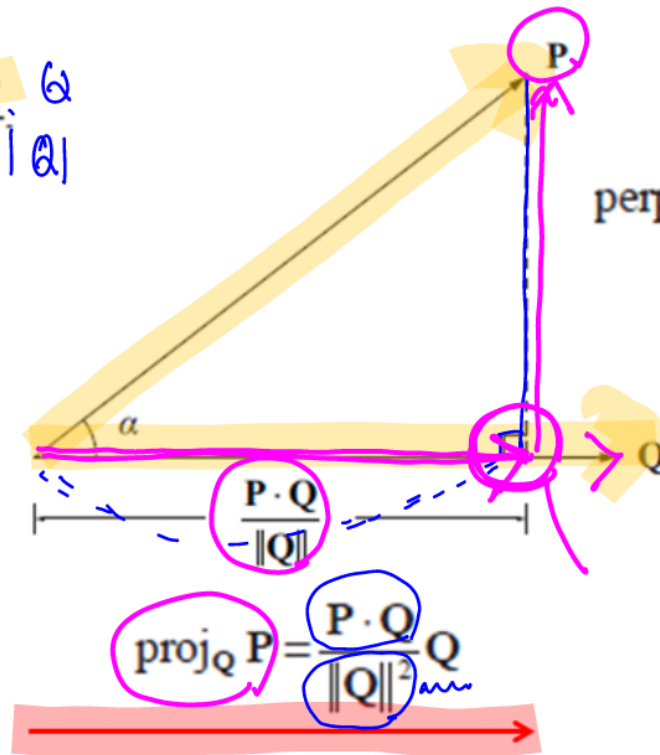


# @ Vector Decomposition.

$$\|P\| \cos \alpha = \frac{P \cdot Q}{\|Q\|}$$

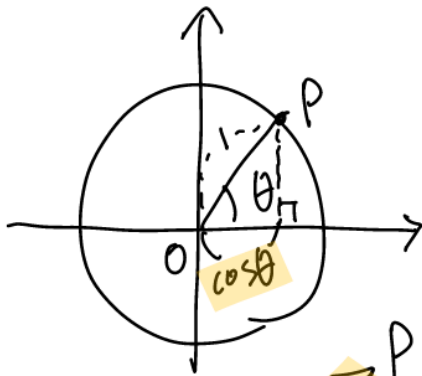
$$\frac{Q}{|Q|}$$



$$\text{perp}_Q P = P - \text{proj}_Q P$$

$$= P - \frac{P \cdot Q}{\|Q\|^2} Q$$

$$\text{proj}_Q P = \frac{P \cdot Q}{\|Q\|^2} Q$$



$$P \cdot Q = \|P\| \cdot \|Q\| \cos \theta$$

$$\frac{P \cdot Q}{\|Q\|}$$

