

Thm Properties of Dot Product

If $\vec{u}, \vec{v}, \& \vec{w}$ are vectors & c is scalar (i.e. number) $\Rightarrow$

$$1) \vec{u} \cdot \vec{v} = \vec{v} \cdot \vec{u}$$

$$2) (c\vec{u}) \cdot \vec{v} = \vec{u} \cdot (c\vec{v}) = c(\vec{u} \cdot \vec{v})$$

$$3) \vec{u} \cdot (\vec{v} + \vec{w}) = \vec{u} \cdot \vec{v} + \vec{u} \cdot \vec{w}$$

$$4) \vec{u} \cdot \vec{u} = |\vec{u}|^2$$

$$5) \vec{0} \cdot \vec{u} = \vec{0}$$

Thm Properties of Cross Product

If $\vec{u}, \vec{v}, \& \vec{w}$ are vectors & r, s scalars $\Rightarrow$

$$1) (r\vec{u}) \times (s\vec{v}) = (rs)(\vec{u} \times \vec{v})$$

$$2) \vec{u} \times (\vec{v} + \vec{w}) = \vec{u} \times \vec{v} + \vec{u} \times \vec{w}$$

$$3) (\vec{v} + \vec{w}) \times \vec{u} = \vec{v} \times \vec{u} + \vec{w} \times \vec{u}$$

$$4) \vec{v} \times \vec{u} = -(\vec{u} \times \vec{v})$$

$$5) \vec{0} \times \vec{u} = \vec{0}$$