

Scalar product

$$\text{v.v.g } \underline{u \cdot v} = |u||v|\cos\theta \quad 0 \leq \theta \leq \pi$$

v.v.gm

Two non-zero vectors u and v are perpendicular (orthogonal)

$$u \cdot v = 0$$

$$u \cdot v = |u||v|\cos\frac{\pi}{2} \quad \therefore \cos\frac{\pi}{2} = 0$$

$$u \cdot u = |u|^2$$

projection of one vector upon another vector

$$\text{Projection of } v \text{ along } u = \frac{v \cdot u}{|u|}$$

Cross product or vector product

$$u \times v = |u \times v| \sin\theta \quad 0 \leq \theta \leq \pi$$

parallel vector

If $\sin\theta = 0$ then u and v are $(u \times v)$ parallel

Area of parallelogram

$$= |u \times v|$$

Area of Triangle

$$\frac{1}{2} |u \times v|$$

Scalar triple product

$$u \cdot (v \times w)$$

vector triple product

$$u \times (v \times w)$$

If $0 \leq \theta \leq \frac{\pi}{2}$ If A, B, C form hand system $AB \times AC$