## **Dot Product**

The dot product of two vectors u and v is denoted by  $u \cdot v$ .

$$ec{u}=\langle u_1,u_2,u_3
angle, ec{v}=\langle v_1,v_2,v_3
angle \ u\cdot v=u_1v_1+u_2v_2+u_3v_3$$

The Angle Between Two Vectors u and v is,

$$heta = \cos^{-1}\left(rac{ec{u}\cdotec{v}}{||ec{u}||\ ||ec{v}||}
ight)$$

Dot product of two vectors u and v is also given by,

$$ec{u}\cdotec{v}=||ec{u}||\ ||ec{v}||\cos heta$$

Projection,

$$\mathrm{proj}_b a = \left(rac{a \cdot b}{||b||}
ight)rac{b}{||b||}$$

scalar component of a in the direction of b,

$$\mathrm{comp}_b a = rac{a \cdot b}{||b||} = ||a|| \cos heta$$

**Properties**