

26
30
41
79

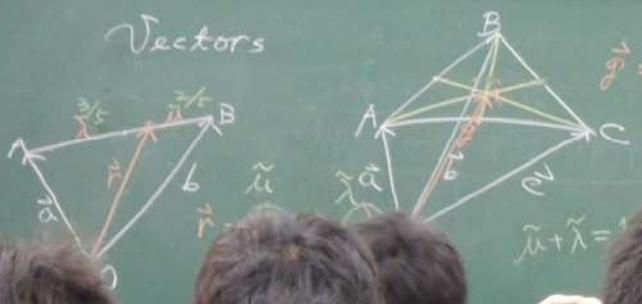
π : pie
 ν : nu
 μ : mu
 λ : lambda

σ : sigma
 θ : theta

$$\prod_{n=1}^N a_n = a_1 \cdot a_2 \cdot \dots \cdot a_N$$

$$\sum_{n=1}^N a_n = a_1 + a_2 + \dots + a_N$$

Vectors



$$\vec{g} = \frac{1}{3}(\vec{a} + \vec{b} + \vec{c})$$

$$\vec{u} + \vec{\lambda} = 1$$

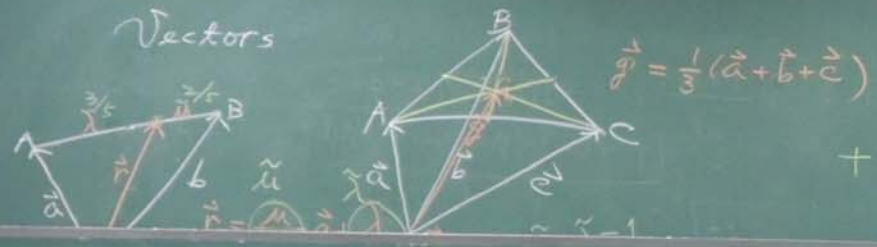
純量積 = 內積 $\vec{a} \cdot \vec{b} = |\vec{a}| |\vec{b}| \cos \theta$ $\vec{a} \cdot \vec{b} = 0 \Rightarrow \vec{a} \perp \vec{b}$

scalar product
 inner ~
 dot ~





Vectors



$\cos(0) = 1$
 $\cos(\frac{\pi}{2}) = 0$
 $\cos(\pi) = -1$

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



scalar product
 inner ~
 dot ~

$\vec{a} \cdot \vec{b} = |\vec{a}| |\vec{b}| \cos \theta$

$\vec{b} \parallel \vec{a}$

向量積: vector product $\vec{a} \times \vec{b} = (ab \sin \theta) \hat{n}$
 × 積



$$\vec{a} \cdot \vec{b} = \vec{b} \cdot \vec{a}$$

$$\vec{a} \cdot (\vec{b} + \vec{c}) = \vec{a} \cdot \vec{b} + \vec{a} \cdot \vec{c}$$

$$\vec{a} \cdot (\vec{b} \times \vec{c}) = (\vec{a} \cdot \vec{b}) \cdot \vec{c}$$

$$\begin{aligned} \vec{a} \times (\vec{b} \times \vec{c}) &= (\vec{a} \times \vec{b}) \times \vec{c} = -\vec{c} \times (\vec{a} \times \vec{b}) \\ &= -(\vec{c} \cdot \vec{b})\vec{a} + (\vec{c} \cdot \vec{a})\vec{b} \\ &= (\vec{a} \cdot \vec{c})\vec{b} - (\vec{a} \cdot \vec{b})\vec{c} \end{aligned}$$

$$\vec{c} \cdot (\vec{a} \times \vec{b}) = \vec{a} \cdot (\vec{b} \times \vec{c}) = \vec{b} \cdot (\vec{c} \times \vec{a})$$

$$|\vec{a} \cdot (\vec{b} \times \vec{c})| \neq 0$$

$$\vec{a} \cdot (\vec{b} \times \vec{c}) = 0$$

$\vec{a}, \vec{b}, \vec{c}$ 在同一平面内



$$\begin{aligned} \cos(0) &= 1 \\ \cos(\pi/2) &= 0 \\ \cos(\pi) &= -1 \end{aligned}$$

scalar product
inner
dot

$$\vec{a} \cdot \vec{b} = |\vec{a}| |\vec{b}| \cos \theta$$

$$\vec{b} \cdot \vec{a}$$

向量积: Vector product
X 种 cross

$$\vec{a} \times \vec{b} = (ab \sin \theta) \hat{n}$$





資料表請繳及
16.26
90.30
91.41
79

$$\vec{a} \cdot \vec{b} = \vec{b} \cdot \vec{a}$$

$$\vec{a} \cdot (\vec{b} + \vec{c}) = \vec{a} \cdot \vec{b} + \vec{a} \cdot \vec{c}$$

$$\vec{a} \cdot (\vec{b} \times \vec{c}) = (\vec{a} \cdot \vec{b}) \cdot \vec{c}$$

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

$$\parallel$$

$$(\vec{a} \cdot \vec{c})\vec{b} - (\vec{a} \cdot \vec{b})\vec{c} = -(\vec{c} \cdot \vec{b})\vec{a} + (\vec{c} \cdot \vec{a})\vec{b}$$

$$\vec{c} \cdot (\vec{a} \times \vec{b}) = \vec{a} \cdot (\vec{b} \times \vec{c}) = \vec{b} \cdot (\vec{c} \times \vec{a})$$

$|\vec{a} \cdot (\vec{b} \times \vec{c})| \neq 0$

$\vec{a} \cdot (\vec{b} \times \vec{c}) \neq 0$

$\vec{v} = \alpha \vec{a} + \beta \vec{b} + \gamma \vec{c}$

三維 \downarrow

$\vec{v} \rightarrow (\alpha, \beta, \gamma)$

$\vec{a}, \vec{b}, \vec{c}$ 在同一平面內

$\vec{v} = \alpha \vec{a}$

$\vec{a} = \text{系統}$

$\vec{a} \times \vec{b} \neq 0$

$$\cos(0) = 0$$

$$\cos(\pi/2) = 0$$

$$\cos(\pi) = -1$$

scalar product \sim inner \sim dot \sim n 維

向量積: vector product \sim cross \sim \times 運算

$\vec{a} \cdot \vec{b} = |\vec{a}| |\vec{b}| \cos \theta$

$\vec{a} \times \vec{b} = (ab \sin \theta) \hat{n}$

$$\vec{a} \cdot \vec{b} = \vec{b} \cdot \vec{a}$$

$$\vec{a} \cdot (\vec{b} + \vec{c}) = \vec{a} \cdot \vec{b} + \vec{a} \cdot \vec{c}$$

$$\vec{a} \cdot (\vec{b} \times \vec{c}) = (\vec{a} \times \vec{b}) \cdot \vec{c}$$

$$\vec{c} \cdot (\vec{a} \times \vec{b}) = \vec{a} \cdot (\vec{b} \times \vec{c}) = \vec{b} \cdot (\vec{c} \times \vec{a})$$

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

$|\vec{a} \cdot (\vec{b} \times \vec{c})| \neq 0$
 $\vec{a} \cdot \vec{a} = a^2 \cos 0 = a^2$
 $|\vec{a}| = \sqrt{\vec{a} \cdot \vec{a}}$
 $\vec{v} = \alpha \vec{a} + \beta \vec{b} + \gamma \vec{c}$
 $\vec{v} \rightarrow (\alpha, \beta, \gamma)$

純量積 = 内積
 scalar product
 $\vec{a} \cdot \vec{b} = |\vec{a}||\vec{b}|\cos\theta$
 $\vec{a} \cdot \vec{b} = 0 \rightarrow \vec{a} \perp \vec{b}$

$\vec{a} \cdot (\vec{a} \times \vec{b}) = 0$
 $\vec{a} \cdot \vec{a} = a^2$
 $\vec{a} \cdot \vec{b} = a b \cos\theta$
 $\vec{a} \cdot \vec{c} = a c \cos\phi$

$\hat{i} = \vec{e}_1$
 $\hat{j} = \vec{e}_2$
 $\hat{k} = \vec{e}_3$
 $\vec{A} = A_x \hat{i} + A_y \hat{j} + A_z \hat{k}$
 $\vec{A} \rightarrow (A_x, A_y, A_z)$
 $\vec{A} \cdot \vec{B} = A_x B_x + A_y B_y + A_z B_z$
 $\hat{i} \cdot \hat{i} = 1 = \hat{j} \cdot \hat{j} = \hat{k} \cdot \hat{k}$
 $\hat{i} \cdot \hat{j} = 0 = \hat{j} \cdot \hat{k} = \hat{k} \cdot \hat{i}$