

1 維 } 運動  
2 維 }  
3 維 }  
牛頓定律  
動量  
能量  
重力

轉動  
流體力學  
熱力學

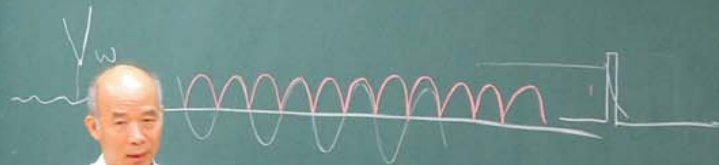
$$\lambda = \frac{h}{p}$$
$$p = \frac{h}{\lambda}$$
$$h = \lambda p$$

$$\vec{p} = m\vec{v}$$

$$\vec{F} = m\vec{a}$$

$$E = h\nu = h \frac{c}{\lambda}$$

$$p = \frac{E}{c} = \frac{h}{\lambda}$$

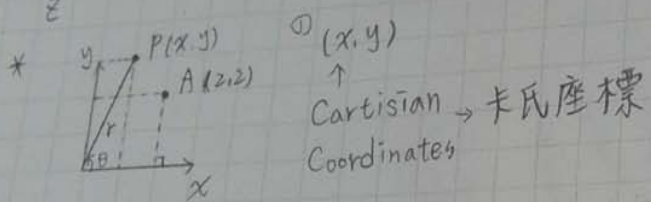
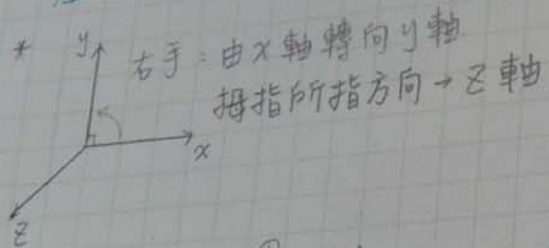


$\sigma$  ( $\frac{1}{\Omega \cdot \text{cm}}$ )  
 $K$  (W/mK)  
 $\nu$  (1/s)

- 10/13
- \* 座標
- 複數
- 三角函數
- 向量

- 極限
- 微分
- 積分

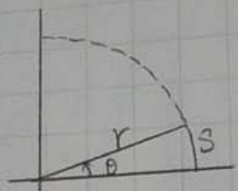
### 座標



$\vec{OP} = r$       ②  $(r, \theta)$   
Polar -> 極座標

$$\begin{cases} 0 \leq r < \infty \\ 0 \leq \theta < 360^\circ \\ 0 \leq \theta < 2\pi \text{ (弧度)} \end{cases}$$

### \* 弧度 radian



$$\theta = \frac{s}{r}$$

$$\theta = 360^\circ \rightarrow \frac{2\pi r}{r} = 2\pi$$

$$180^\circ \rightarrow \pi \text{ (rad)}$$

$$90^\circ \rightarrow \frac{\pi}{2}$$

$$\left(\theta \times \frac{\pi}{180^\circ}\right) \rightarrow \text{rad}$$

$$\Rightarrow \sin x = \frac{x}{1!} - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots$$

弧度<sup>2</sup>

$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \dots$$

$$e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$$

### \* 複數

### 虛數

$$z_1 = a + bi \quad \left( \sqrt{-1} \equiv i \right)$$

$$z_2 = c + di \quad \left( i^2 = -1 \right)$$

$$z_1 + z_2 = (a+c) + (b+d)i$$

$$z_1 - z_2 = (a-c) + (b-d)i$$

$$z_1 \cdot z_2 = z_2 \cdot z_1$$

$$= ac + (ad+bc)i - bd$$