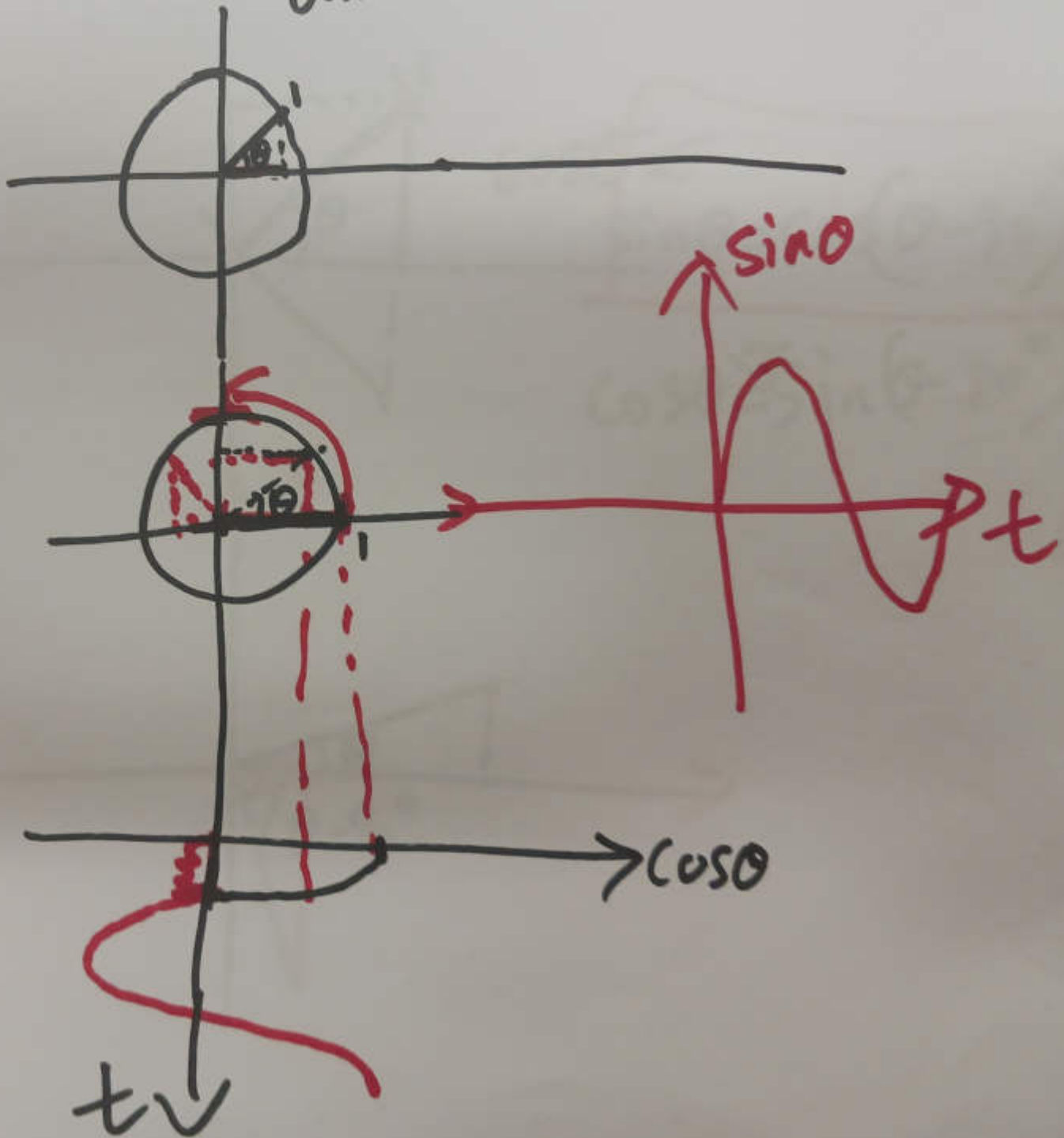
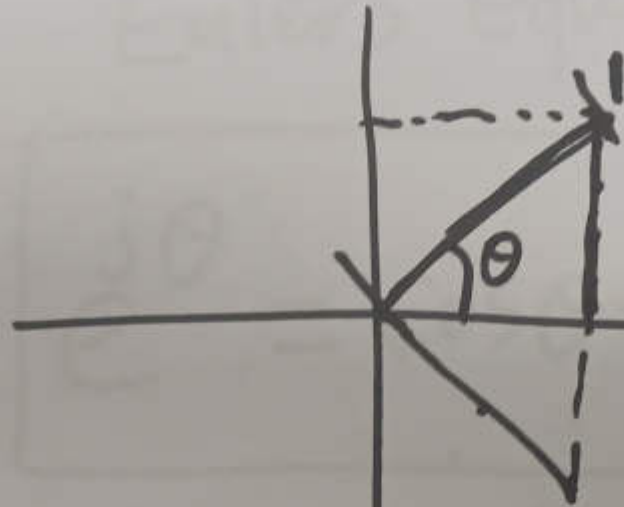


unit circle



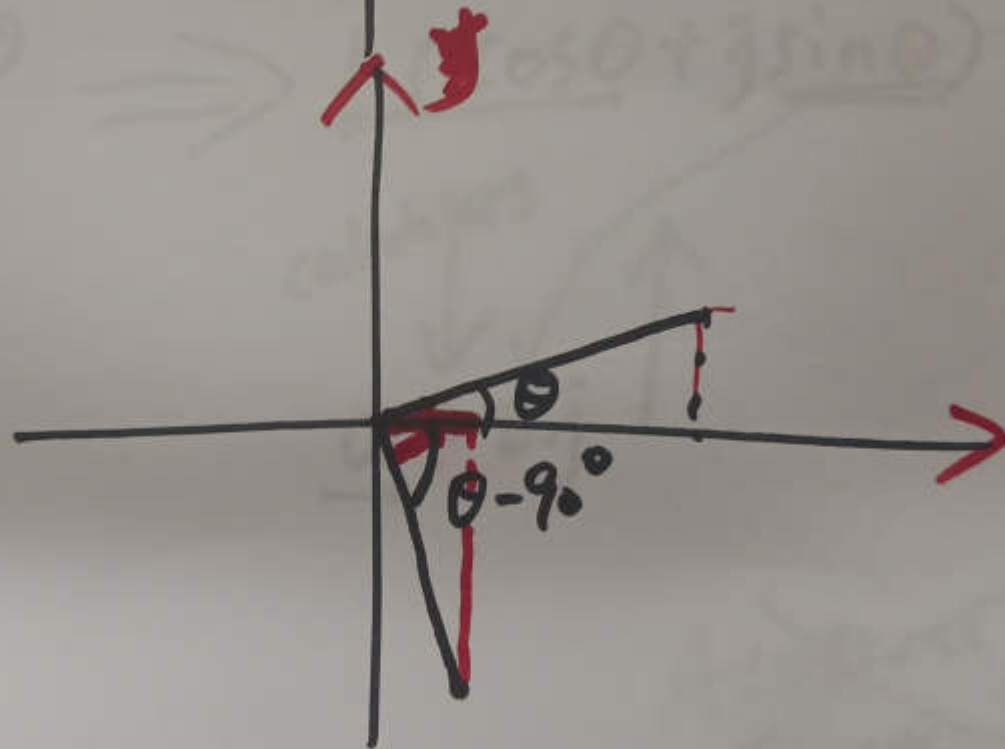
①



~~cos theta =~~

$$\sin \theta = \cos(\theta - 90^\circ)$$

$$\cos \theta = \sin(\theta - 90^\circ)$$



(2)

# Euler's Equation

√

$$e^{j\theta} = \cos\theta + j\sin\theta$$

$$\underline{Ae^{j\theta}} \Rightarrow \underline{A(\cos\theta + j\sin\theta)}$$

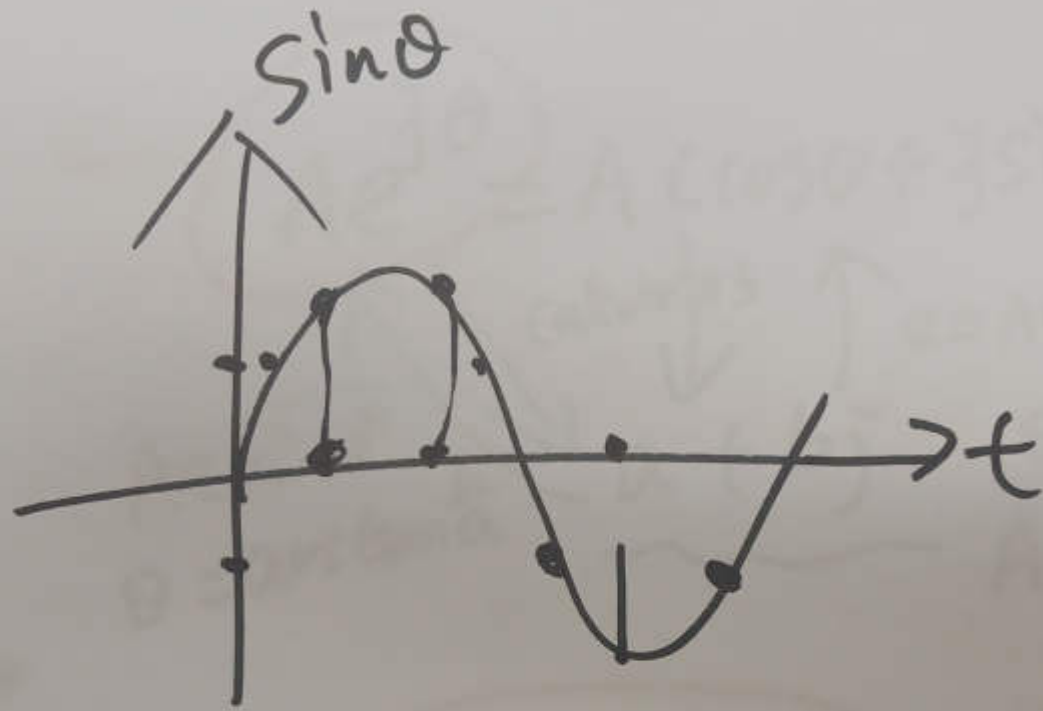
calculator

$$\underline{a + bj}$$

$$\theta = 52^\circ$$
$$\cos\theta$$
$$\cos 52^\circ$$

~~$$A\cos\theta = a$$
$$\cos\theta = \frac{a}{A}$$
$$\theta = \arccos\left(\frac{a}{A}\right)$$~~

(3)



④

ALQ

$$Ae^{j\theta} = A(\cos\theta + j\sin\theta)$$

calculus

$$A = \sqrt{a^2 + b^2}$$
$$\theta = \arctan \frac{b}{a}$$
$$a + bj$$
$$a = A\cos\theta, b = A\sin\theta$$
$$\theta = \arctan \frac{b}{a}$$
$$A = \sqrt{a^2 + b^2}$$

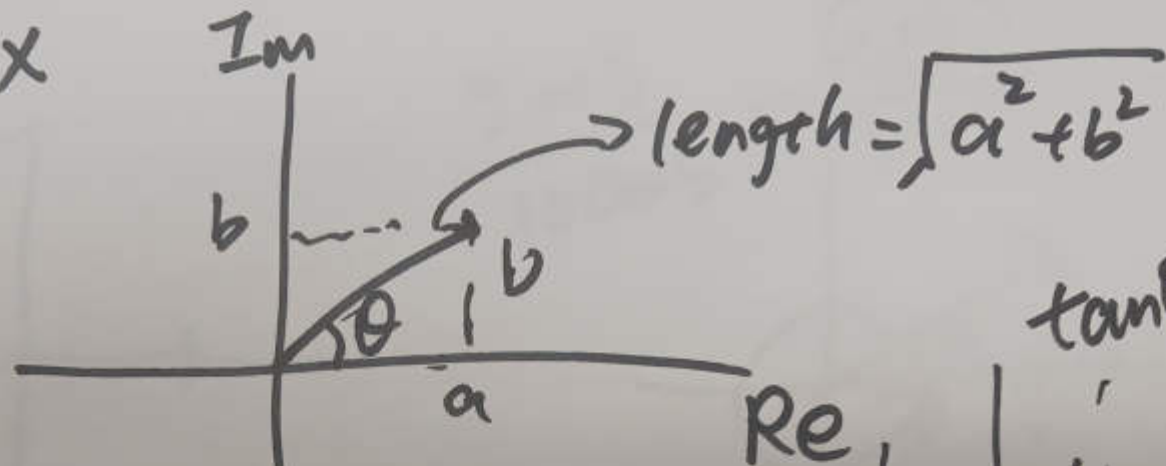
Amplitude  
and phase

$$Ae^{j\theta} \rightarrow A \cos(\omega t + \theta)$$

given

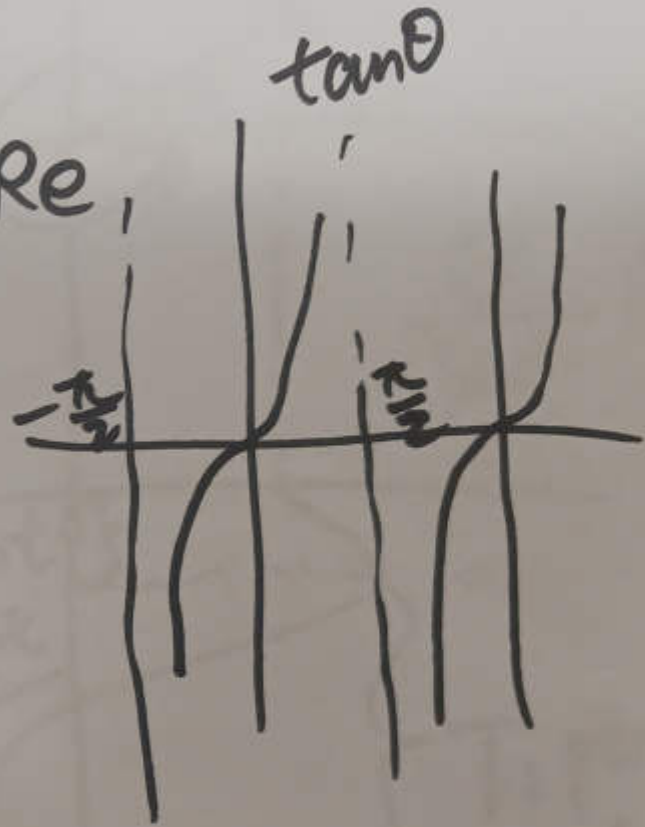
(6)

complex  
plane



$$\tan \theta = \frac{b}{a}$$

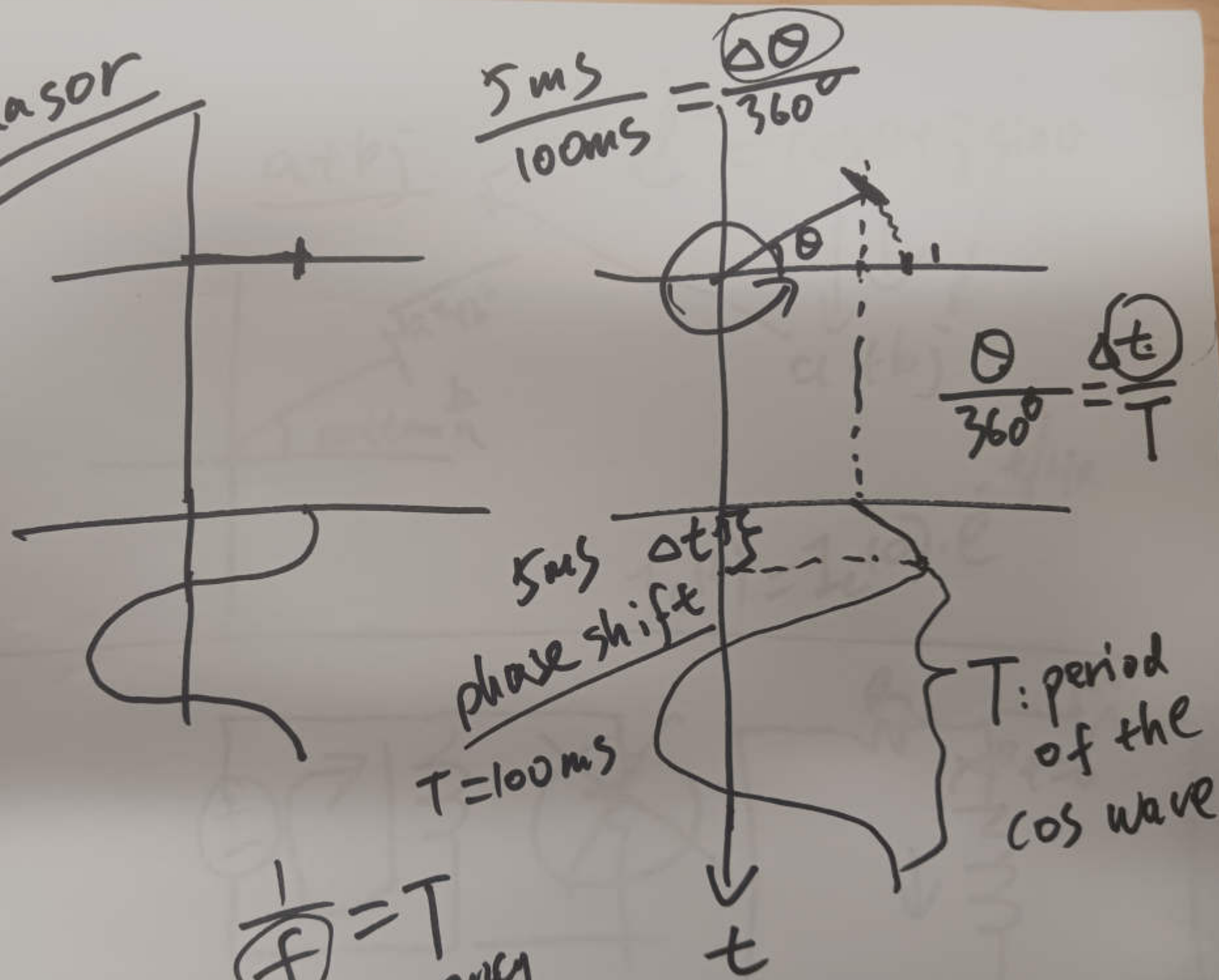
$$\theta = \arctan \frac{b}{a}$$



①



Phasor



$$\frac{5\text{ms}}{100\text{ms}} = \frac{\Delta\theta}{360^\circ}$$

$$\frac{\theta}{360^\circ} = \frac{\Delta t}{T}$$

5ms  $\Delta t$   
phase shift  
T = 100ms

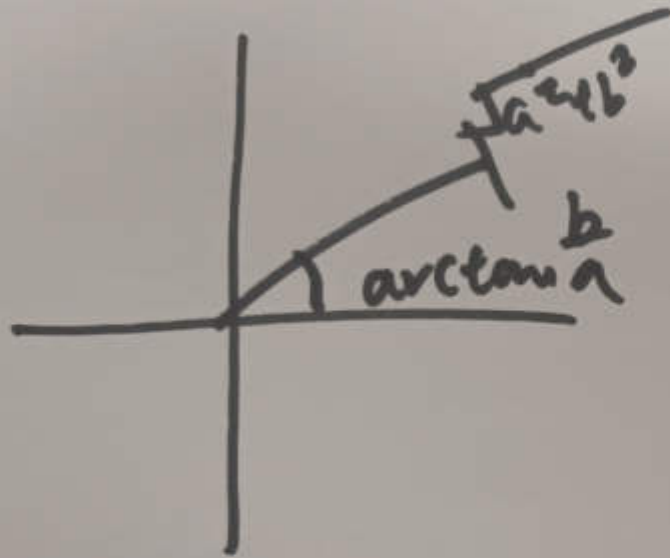
T: period of the cos wave

$$\frac{1}{f} = T$$

frequency

$$a + bj$$

$$e^{j\theta} = \cos\theta + j\sin\theta$$



$$a + bj$$

$$I_L(t) = I_L(0) \cdot e^{-t/4R}$$

