6/18/14

EE220 D

Lecture 9D

$t_0 \cdot f = 360°$

$\frac{t_0}{T} \cdot 2\pi$

$\frac{t_0}{T} \cdot 360$ degrees

V_2 lags V_1

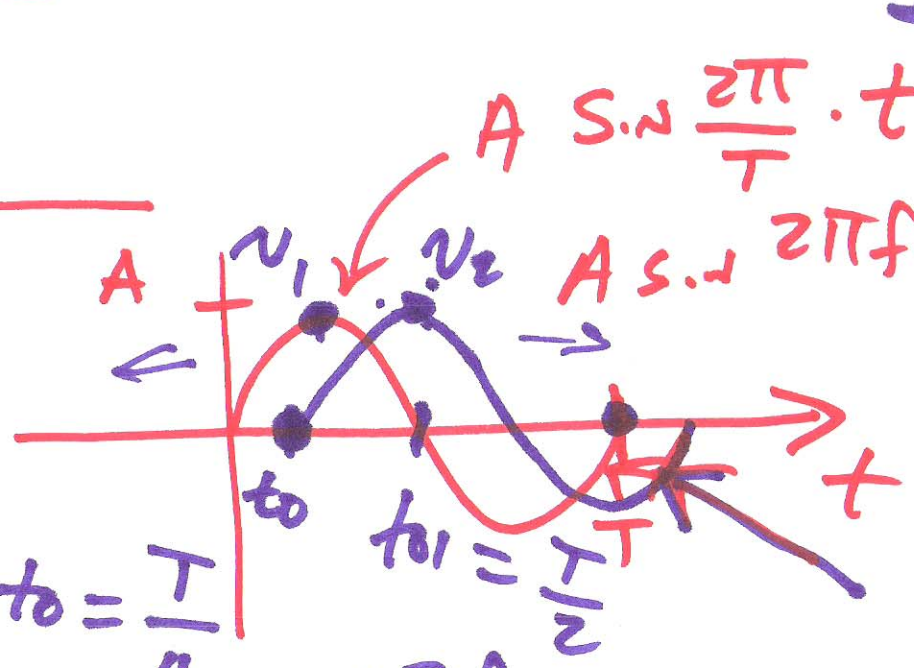
V_1 leads V_2

$1 \angle 90° \rightarrow$ sin

$1 \angle 0° \rightarrow$ cos

phase-shift

time delay



$90° \rightarrow t_0 = \frac{T}{4}$

$180°$

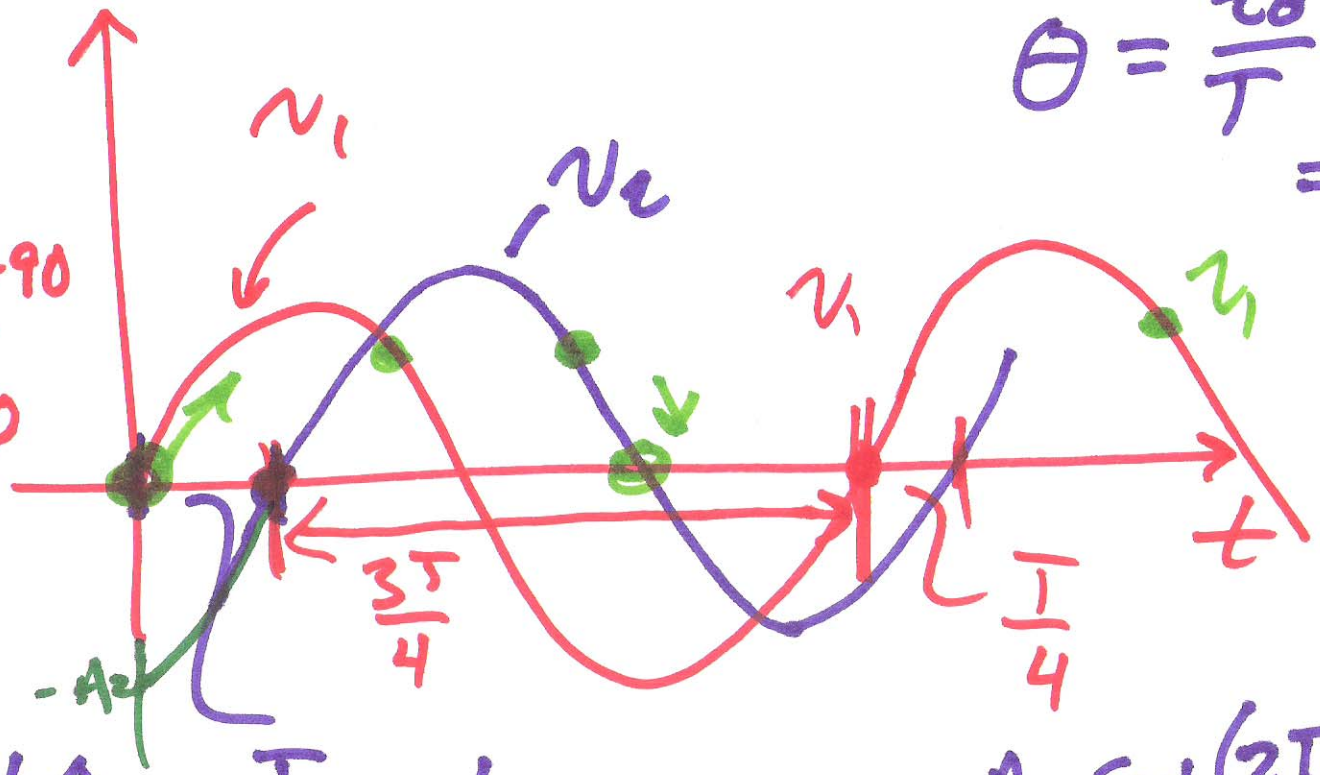
$\theta = \frac{t_d}{T} \cdot 2\pi$

$= \frac{t_d}{T} \cdot 360$

$V_1 = A_1 \angle 0$

$V_2 = A_2 \angle -90$

$= A_2 \angle 270$



$\theta = \frac{T/4}{T} \cdot 360$

$\frac{T}{4} = t_d$

$v_2 = A_2 \sin\left(\frac{2\pi}{T} \cdot t - 90°\right)$

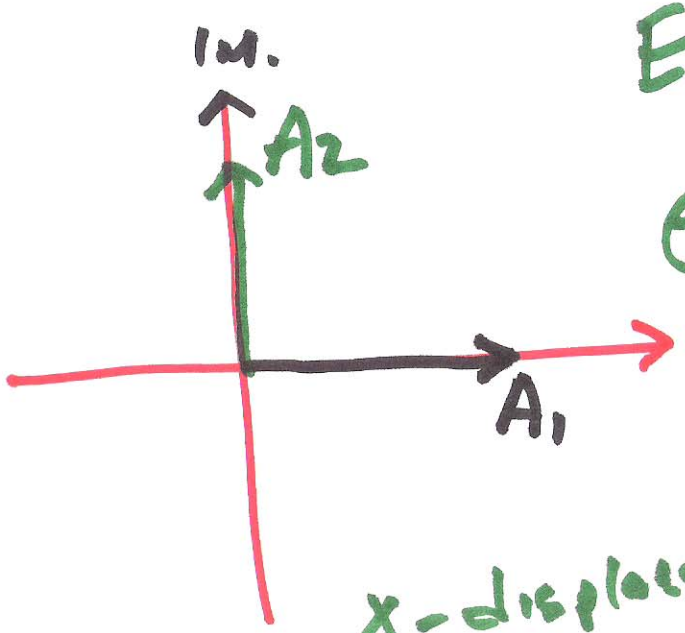
$v_1 = A_1 \sin\left(\frac{2\pi}{T} \cdot t\right)$

$\theta = \frac{3T/4}{T} \cdot 360 = 270$

v_2 lags v_1

v_1 leads v_2

$v_2 = A_2 \sin\left(\frac{2\pi}{T} \cdot t + 270\right)$



Euler's identity

$e^{j2\pi ft} = e^{j\frac{2\pi}{T}\cdot t} = e^{j\omega\cdot t}$

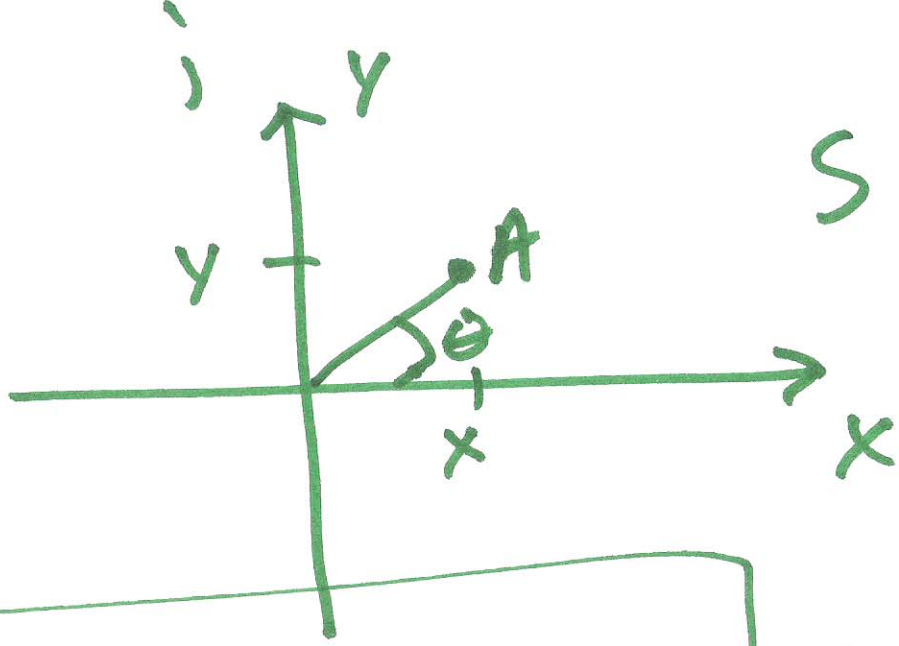
$f = \frac{1}{T}$

$\omega = 2\pi f$

$\frac{2\pi}{T}$

$e^{j2\pi f\cdot t} = \overbrace{\cos 2\pi f\cdot t}^{\text{x-displacement}} + j\overbrace{\sin 2\pi f\cdot t}^{\text{y-displacement}}$

$j = \sqrt{-1} = i$



$$S = X + jY$$

phasor

$$A \angle \theta$$

$$A = \sqrt{x^2 + y^2}$$

$$\theta = \tan^{-1}\frac{y}{x}$$

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

$$A = \sqrt{A^2\cos^2\theta + A^2\sin^2\theta}$$

$$\theta = \tan^{-1}\frac{\sin\theta}{\cos\theta} =$$