Parseval's Power Relation

$$P_x = \sum_k |X_k|^2$$

pg. 252

$A\cos(\Omega_0 t) \rightarrow e^{-j\Omega_0 t}$ → $X_0 + A\cos(\Omega_0 t)$

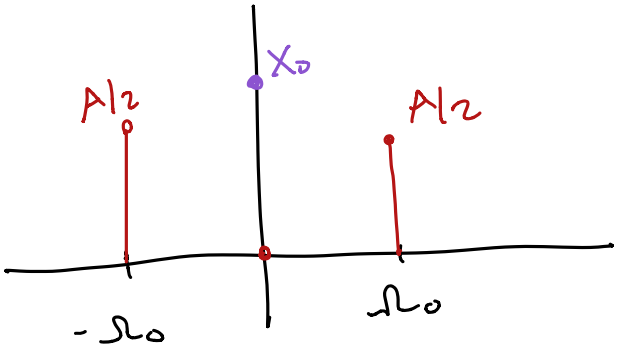
X_0 ↓ baseline

$P_x = \left|\frac{A}{2}\right|^2 + \left|\frac{A}{2}\right|^2$

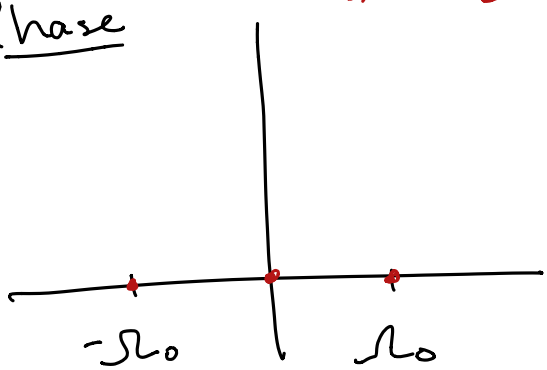
ex: $A = 1$

$P_x = \frac{1}{2}$

MAG



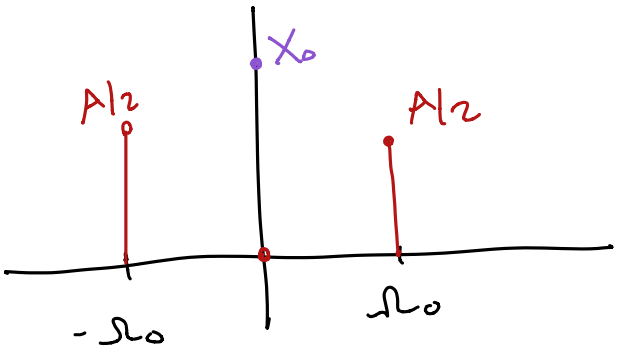
Phase



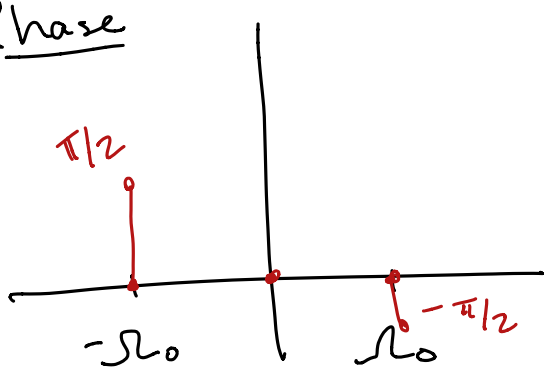
$A\sin(\Omega_0 t)$ → phase from cos is $-\frac{\pi}{2}$

↳ $X_0 + A\sin(\Omega_0 t) \rightarrow e^{-j\Omega_0 t - \pi/2}$

MAG



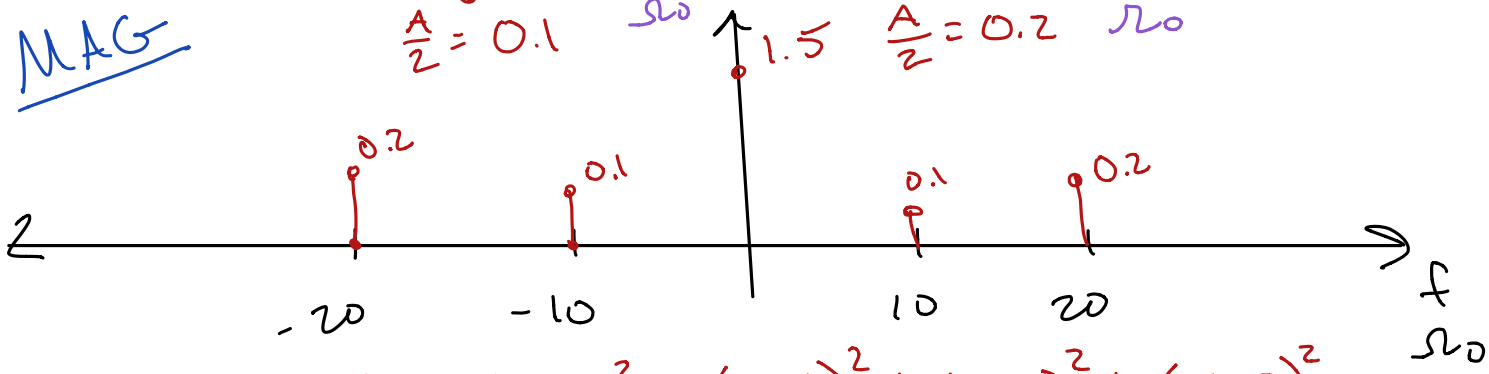
Phase



$x(t) = 1.5 + 0.2\cos(10t) + 0.4\sin(20t)$

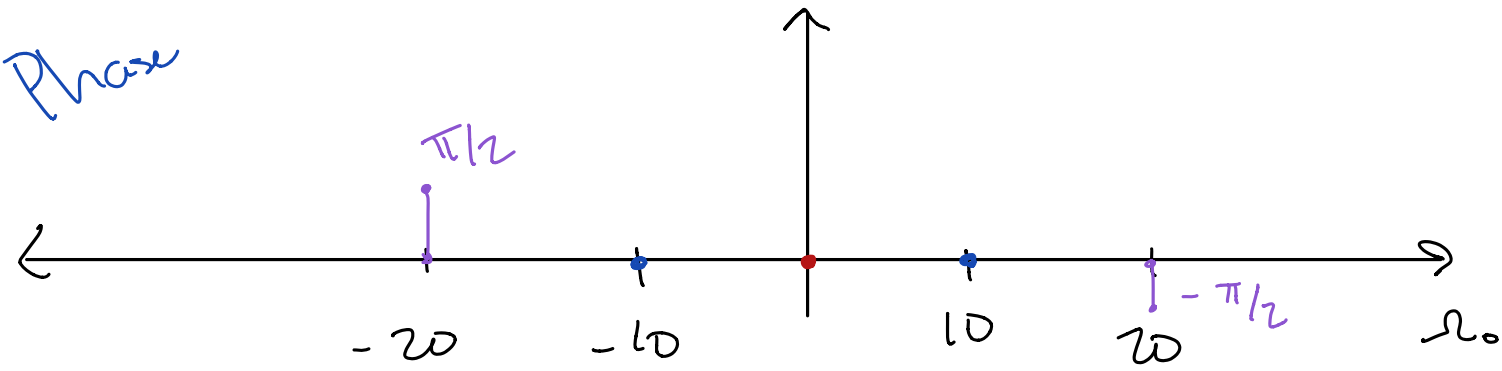
$\frac{A}{2} = 0.1$ Ω_0 $\quad$ $\frac{A}{2} = 0.2$ Ω_0

MAG



$P_x = (0.2)^2 + (0.1)^2 + (0.1)^2 + (0.2)^2 = 0.1$

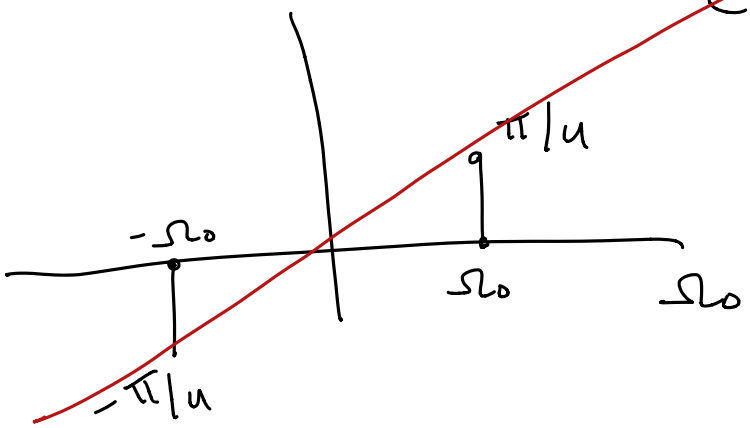
Phase



$A\sin(\Omega_0 t + \pi/4)$

timestamp 30:30

$e^{j(\Omega_0 - \pi/2 + \pi/4)}$



Unsure

Equation Format

$$x(t) = X_0 + A\cos(\Omega_0 t + \theta) + B\sin(\Omega_0 t + \theta)$$

X_0 ↓ baseline

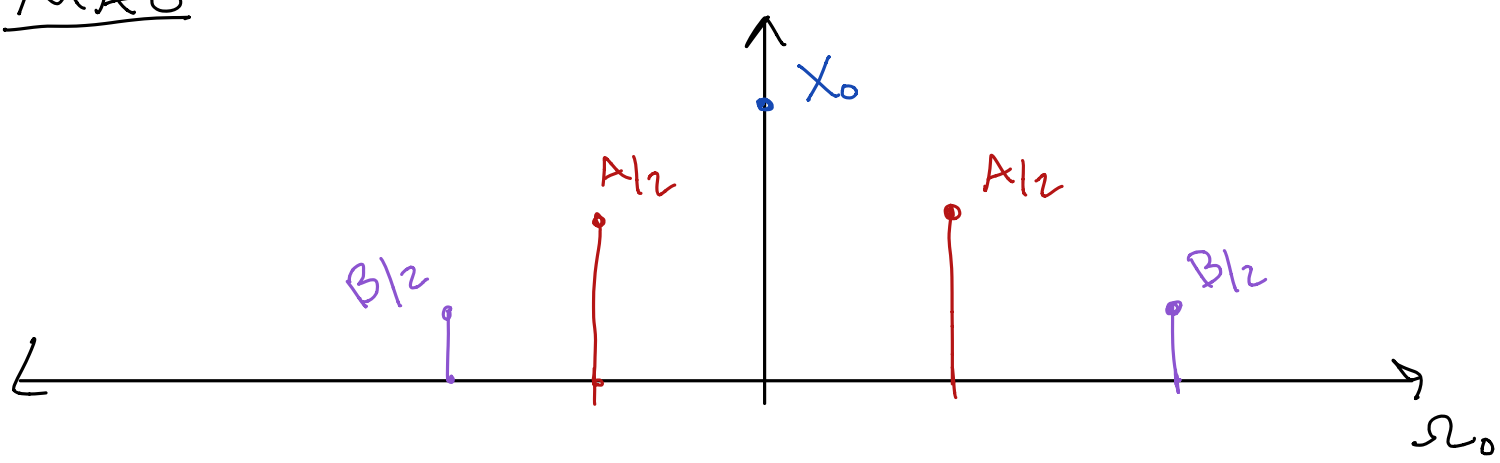
For magnitude spectrum, graph:

$\frac{A}{2}$ or $\frac{B}{2}$ at Ω_0

For phase graph:

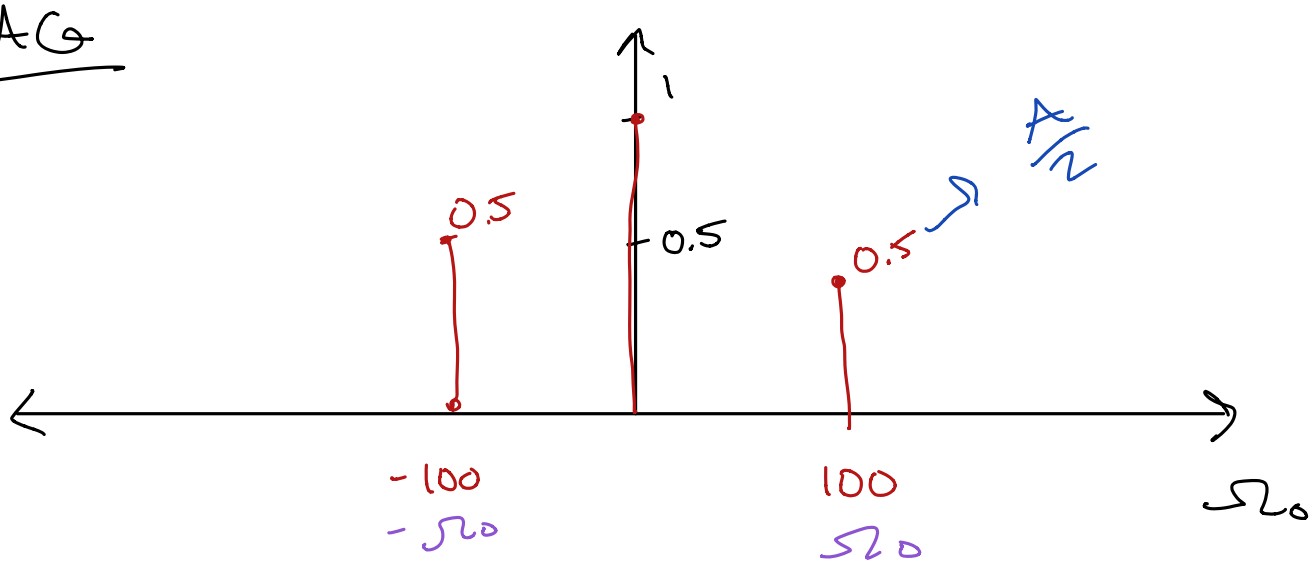
θ at Ω_0

MAG

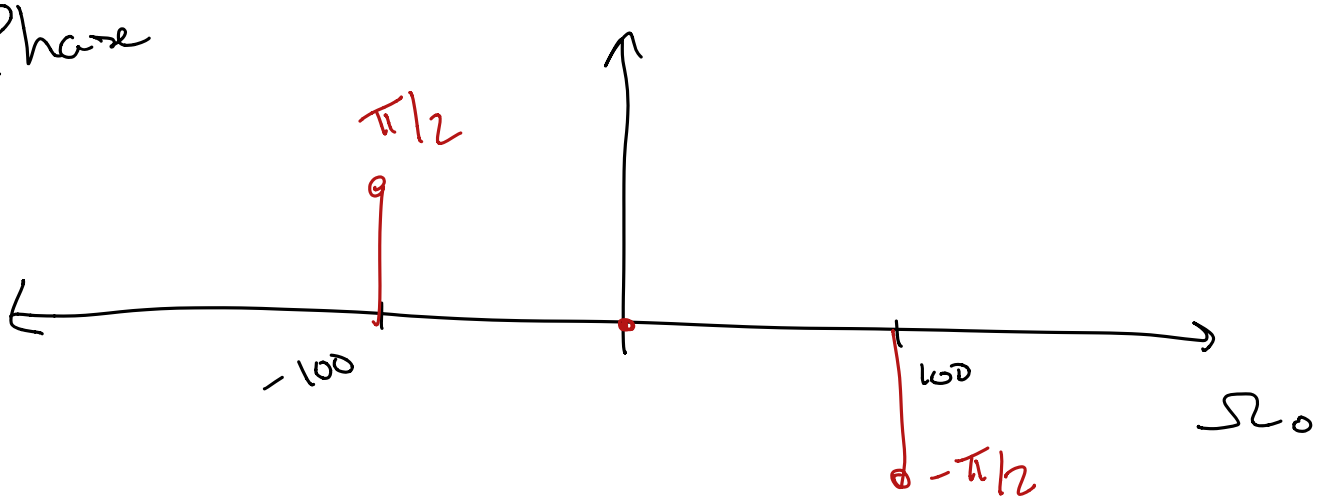


★ ask about phase

MAG



Phase



What is the equation?

$$x(t) = 1 + \sin(100t)$$

Pg. 259

★ Review quiz → esp. #1!