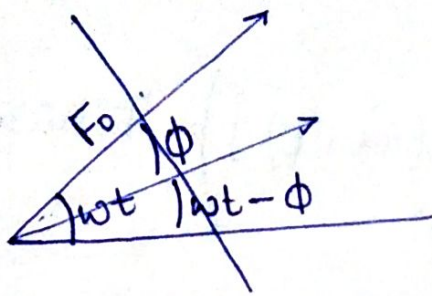


To find steady state solⁿ by vector polygon -



$$m\ddot{x} + kx + c\dot{x} = F_0 \sin \omega t$$

$$\downarrow$$

$$x = x_0 \sin(\omega t - \phi)$$

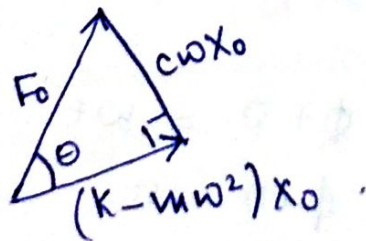
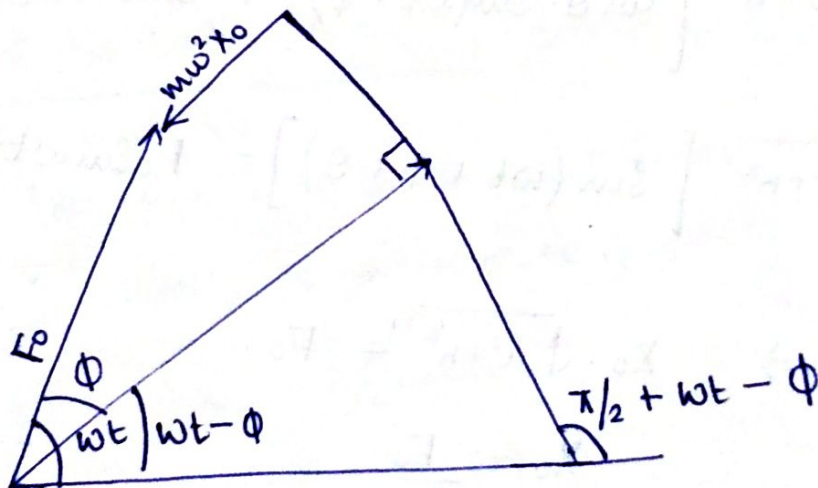
$$m\ddot{x} + kx + c\dot{x} = F_0 \sin \omega t$$

$$\downarrow \quad \downarrow \quad \downarrow$$

$$c\omega x_0 \sin(\omega t + \phi + \frac{\pi}{2})$$

$$x = x_0 \sin(\omega t - \phi)$$

$$m\ddot{x} \omega^2 \sin(\omega t - \phi + \pi)$$



$$F_0 = \sqrt{(c\omega x_0)^2 + [(k - m\omega^2)x_0]^2}$$