調和地動による 定常応答.

$$m\ddot{x} + c\dot{x} + kx = -m\ddot{y}_0$$

$$y_0 = a_0\cos pt \quad のとき.$$

$$y = \underbrace{y_p}_{特解} + \underbrace{Y}_{余関数}.$$

$$\ddot{x} + 2h\omega\dot{x} + \omega^2 x = -\ddot{y}_0$$

$$= (-a_0\bar{p}\sin pt)'$$

$$= \boxed{a_0 p^2}\cos pt \qquad 調和外力のとき.$$

$$F\cos pt$$

定常応答 特解.

$$y_p = \frac{1}{D^2 + 2h\omega D + \omega^2} \; a_0 p^2 \cos pt.$$

$$= \frac{\boxed{a_0 p^2}}{\sqrt{(\omega^2 - p^2)^2 + (2h\omega p)^2}} \cos(pt - \theta)$$

$$\theta = \tan^{-1}\left(\frac{2h\omega p}{\omega^2 - p^2}\right)$$