$\omega^2 = k/m$

(1) $\frac{d^2x}{dt^2} + \omega^2 x = 0$ ⟹ $x(t) = ?$

$x, 7x, -4/3x$

$\frac{d^2 7x}{dt^2} + \omega^2 (7x) = 0$

$x(t) = \gamma e^{mt}$ ✓

$\frac{d 7x}{dt} = 7\frac{dx}{dt}$

$\frac{d^2 \gamma e^{mt}}{dt^2} + \omega^2 \gamma e^{mt} = 0$

$\frac{d}{dt} e^{mt} = m e^{mt}$

$\frac{d^2}{dt^2} e^{mt} = m \frac{d e^{mt}}{dt} = m^2 e^{mt}$

$\gamma m^2 e^{mt} + \omega^2 \gamma e^{mt} = 0$ / γe^{mt}

$m^2 + \omega^2 = 0$ — Jobee

$m = \pm i\omega$

x_1 ✓ x_2 ✓

$x_1 + 7/6\, x_2$ ✓

$x(t) = \gamma e^{mt}$

$x(t) = -6\gamma_1 e^{i\omega t} + 8\gamma_2 e^{-i\omega t}$ ✓

$x(t) = a e^{i\omega t} + b e^{-i\omega t}$

$\ddot{x} + \omega^2 x = 0$ →

$x(t) = A \sin(\omega t + \delta)$

$\frac{d^2\theta}{dt^2} = \ddot{\theta}$

$\ddot{\theta} + \gamma^2 \theta = 0$ ✓, ?, 井

$\theta = \sin(\gamma t + \delta)$

$\theta(t) = \theta_m \sin(\omega t + \delta)$

$\ddot{\zeta} + \Omega^2 \zeta = 0$ ✓