Consider
\[ x''(t) + \mu^2 x(t) = \cos(\omega t) \]
with \( \mu > 0 \).

(1) Assume \( \mu \neq \omega > 0 \). Find a particular solution of the form
\[ x_P(t) = A \cos(\omega t). \]

(2) Solve for the initial condition \( x(0) = 1, x'(0) = 0 \).

(3) What happens when \( \omega \to \mu \)? (Hint: graph some solutions.) Can you guess a particular solution for the case \( \omega = \mu \)?