Differential Equations (§3.6)

Ex. 1 The IVP: $x'' + 25x = 11 \cos 6x$; $x(0) = x'(0) = 0$

has the solution: $x(t) = \cos 5t - \cos 6t$.

This is an example of **undamped forced motion**.

![Graph of $x(t) = \cos 5t - \cos 6t$](image1)

![Graph of $x(t) = \cos 5t - \cos 6t$](image2)

![Graph of $x(t) = \cos 5t - \cos 6t$ with $f(t) = 2\sin \left(\frac{1}{2}t\right)$](image3)
Ex. 2  The IVP: \( x'' + 25x = 11 \cos \omega x \); \( x(0) = x'(0) = 0 \)

has the solution: \( x(t) = \frac{A}{\omega^2 - 25} (\cos 5t - \cos \omega t) \).