

## Problems Day 49, M 4/22/2024

Topic 24:  $P(D)x = \text{periodic}$

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**Problem 1.** Solve  $\ddot{x} + 9x = \text{sq}(t)$

– Watch for resonance.

– Use the notation  $\phi(n)$  or  $\phi_n$  in the SRF.

**Problem 2.** Solve  $\ddot{x} + 16x = \text{sq}(t)$ . Is there any resonance?

**Problem 3.** Solve  $\ddot{x} + 0.01\dot{x} + 9x = \sum_{n=1}^{\infty} \frac{\cos(nt)}{n^2}$ .

Are there any near-resonant terms?

**Problem 4.** Solve  $\ddot{x} + 10x = \text{sq}(t)$ .

Are there any near-resonant terms?

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ES.1803 Differential Equations

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