1 Background

For the angular momentum section, review the material in sections 3.4-3.5. Chapter 5 deals with oscillations with one degree of freedom.

2 Problems

2.1 From the book.

Exercises 3.24, 5.43, 5.45.

2.2 Additional Problems

1. Find the response of a damped oscillator to a sawtooth driving force:

\[ f(t) = \frac{\omega A}{2\pi} t, \quad -\tau/2 < t < \tau/2, \quad (1) \]

and \( f(t) \) is periodic with period \( \tau \).

2. i) Solve the problem of an oscillator under a simple periodic force (turned on at \( t = 0 \)) by the Green’s function method, and verify that this reproduces the solution given in class. Assume that the damping is less than critical.

*Hint*: \( \sin \omega t = (e^{i\omega t} - e^{-i\omega t}) / 2i \).

ii) Find the response of a damped oscillator to a forcing function of the form:

\[ f(t) = \begin{cases} 0 & t < 0 \\ f_0 e^{-\gamma t} \sin \omega t & t > 0 \end{cases} \quad (2) \]