PHYS 4330 Theoretical Mechanics

Homework # 11

Submission deadline: 23 April 2024 at 11:59 pm Eastern Time

Submission Instructions: Homework is submitted on Gradescope to Homework 11.

1. A string (initially entirely at equilibrium position) is set into motion by being struck at a point $L/4$ from one end by a hammer. The initial velocity is greatest at $x = L/4$ (with a value of v_0) and decreases linearly to zero at $x = 0$ and $x = L/2$. The region $L/2 < x \leq L$ is initially undisturbed. Determine the subsequent motion of the string [q(x,t)]. Discuss which harmonics (if any) are absent from the system.

[10 points]

2. A string is pulled aside a distance h at a point $3L/7$ from one end. At a point $3L/7$ from the other end, the string is pulled aside a distance h in the opposite direction. Discuss the vibrations [q(x,t)] and which harmonics (if any) are absent.

[10 points]