Supplementary problems: 13.4 # 1, 3, 6, 12;
Quiz: 13.4

Compulsory problems:
Consider the wave equation

$$\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2} \tag{1}$$

with the clamped boundary condition $u(0,t) = u(\pi,t) = 0$

(1) **[5 pts.]** Which **one** and only one of the following initial conditions will yield a physically relevant solution (just like in HW6)? You need this to solve # 2, so you better not get this wrong.

(i) $u(x,0) = \cos x; \qquad \partial_t u(x,0) = 0$
(ii) $u(x,0) = \sin 2x; \qquad \partial_t u(x,0) = 0$
(iii) $u(x,0) = \sin(x/2); \quad \partial_t u(x,0) = 0$

(2) **[40 pts.]** For the one initial condition from above that yields a physically relevant solution, solve the wave equation.

(3) **[15 pts.]** A node x_* of a wave is defined as the points where the amplitude is minimum and the point on the wave does not move; i.e., $u(x_*,t) = \partial_t u(x_*,t) = 0$. Find these location of these points (x_*).

Your homework raw score is: $\frac{n}{2m} \cdot M + \left(1 - \frac{n}{2m}\right) \cdot N = N + \frac{n}{2m}(M - N)$. For this homework, $M = 60$, $m = 4$, N is the number of compulsory problems you get correct, and n is the number of supplementary problems you complete. It should be noted that for the supplementary problems I will be looking for **full completion**, but I won't take off points for mistakes.