

LECTURE ASSIGNMENT 2

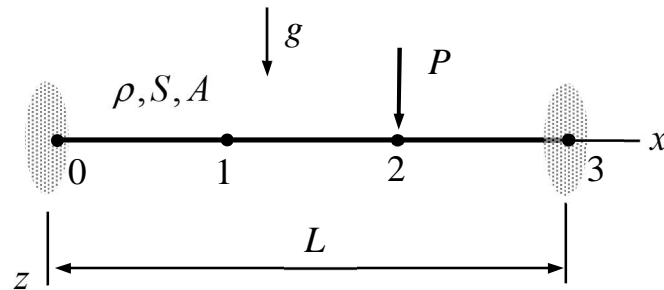
The equations for stationary string and bar problems given by the Finite Element Method on a regular spatial are

$$\frac{k}{\Delta x}(a_{i-1} - 2a_i + a_{i+1}) + F_i + f'\Delta x = 0 \quad i \in \{1, 2, \dots, n-1\},$$

$$\frac{k}{\Delta x}(a_1 - a_0) + F_0 + f'\frac{\Delta x}{2} = 0 \quad \text{or} \quad a_0 = \underline{a}_0,$$

$$\frac{k}{\Delta x}(a_{n-1} - a_n) + F_n + f'\frac{\Delta x}{2} = 0 \quad \text{or} \quad a_n = \underline{a}_n.$$

Write the equations for the stationary string problem of grid points $i \in \{0, 1, 2, 3\}$ shown in the figure. Tightening S , cross-sectional area A , and density of the material ρ are constants.



Name _____ Student number _____

At point $i = 0$, the displacement boundary condition applies

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At point $i = 1$, the equilibrium equation applies

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At point $i = 2$, the equilibrium equation applies

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At point $i = 3$, the displacement boundary condition applies

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