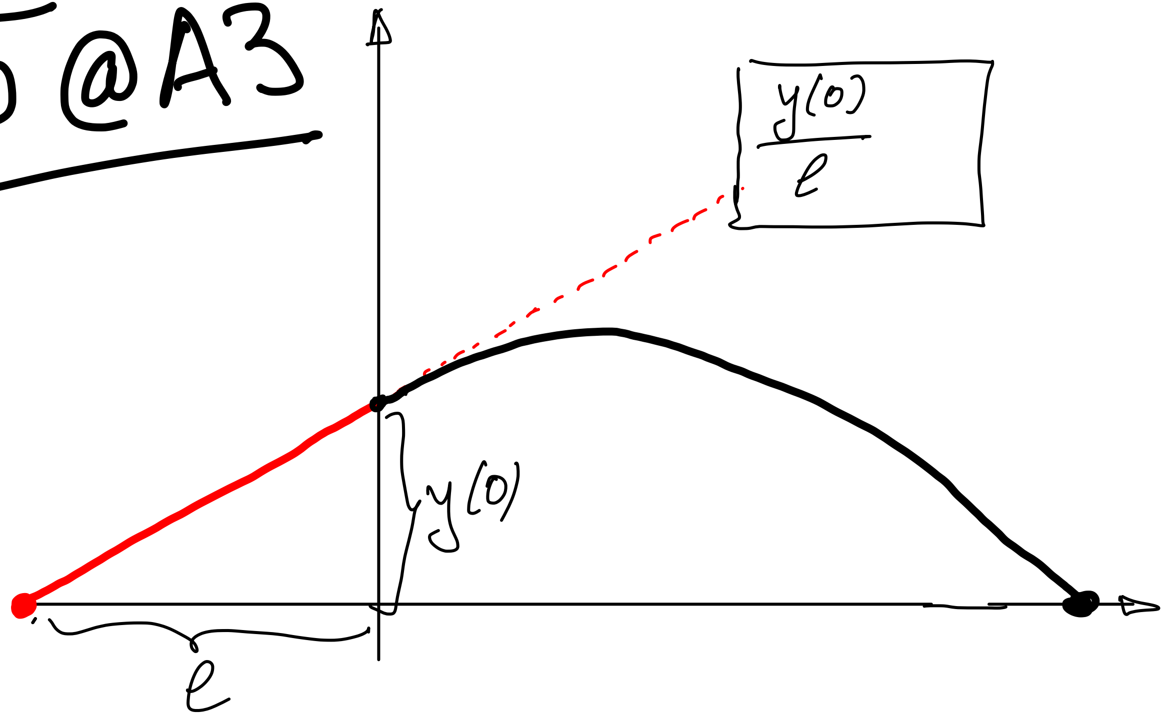
P5 @ A3



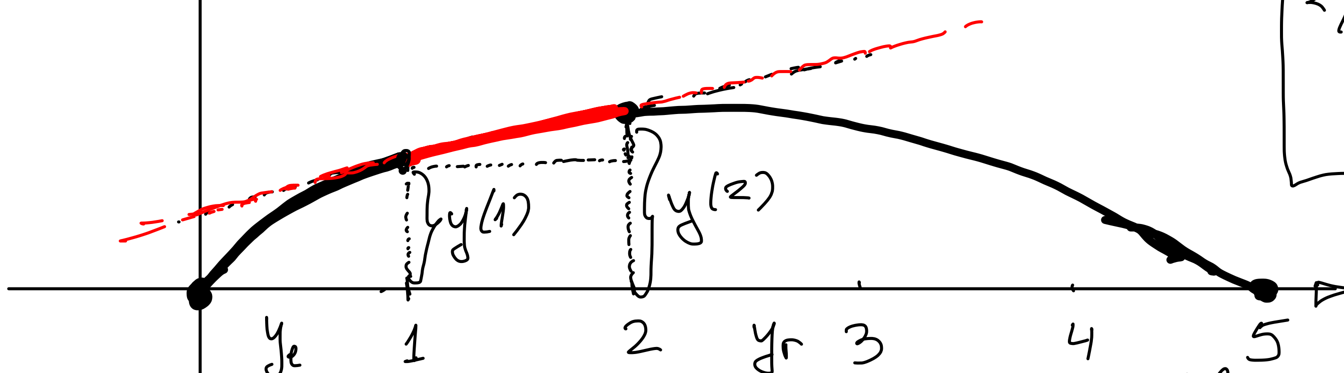
$$y'(1) = y'(2) = \frac{y(2) - y(1)}{1}$$

must play with eigenvalues/eigenfns

$$\frac{3}{1}$$

$3 \div 1 =$

2, 4, 3, 5



The riggid part controls the derivative at 1 and 2

$$-y_e''(x) = \lambda y_e(x) \qquad -y_r''(x) = \lambda y_r(x)$$

$$y_e(0) = 0 \qquad y_r(5) = 0$$

$$y_e'(1) = y_r'(2) = y_r(2) - y_e(1)$$

$$\lambda_1, \lambda_2, \lambda_3, \ldots$$

Fundamental sols: $\lambda = \mu^2, \mu > 0$

IS 0 an eigenvalue

$$y_e(x) = c_1 + c_2 x \qquad y_r(x) = c_3 + c_4 x$$

$$y_e(0) = 0, \; c_1 = 0 \qquad y_r(5) = 0; \; \underline{\underline{y_r(x) = c_4(5-x)}}$$

$$y_\ell'(x) = C_2 \qquad y_r'(x) = C_4$$

$$y_\ell'(1) = y_r'(2) = y_r(2) - y_\ell(1)$$

$$C_2 = C_4 = C_4 \cdot (+3) - C_2$$

$$C_2 + C_4 = 0$$

$$-2C_2 + 3C_4 = 0 \qquad \Rightarrow \qquad C_1 = C_4 = 0$$

$$\begin{vmatrix} 1 & 1 \\ -2 & 3 \end{vmatrix} = 5 \neq 0$$

Magic of Fundam-
ental Solution

$\rightarrow$ It is Flaxible

$$\lambda = \mu^2, \mu > 0$$

$$y_e(x) = C_1 \cos(\mu x) + C_2 \sin(\mu x)$$

$$y_e(0) = 0 \Rightarrow C_1 = 0$$

$$y_e(x) = C_2 \sin(\mu x)$$

$$y_r(x) = C_3 \cos(\mu(5-x)) + C_4 \sin(\mu(5-x))$$

Flexible

Inspired by 2-dim Heat in rectangula Plate sinh, cosh

$$y_r(5) = 0 \Rightarrow C_3 = 0$$

$$y_r(x) = C_4 \sin(\mu(5-x))$$

Keep your options open!