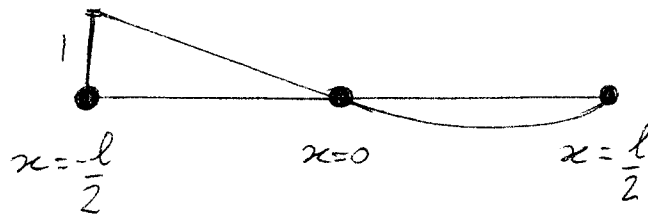


SOLUTION TO TUTORIAL QUESTION 3

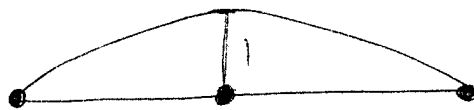


Shape function of the form $y = ax^2 + bx + c$

$$x = 0 \quad y = 0 \Rightarrow c = 0$$

$$\left. \begin{array}{l} x = \frac{l}{2} \quad y = 0 \Rightarrow a \frac{l^2}{4} + b \frac{l}{2} = 0 \\ x = -\frac{l}{2} \quad y = 1 \Rightarrow a \frac{l^2}{4} - b \frac{l}{2} = 1 \end{array} \right\} \Rightarrow \begin{array}{l} a = \frac{2}{l^2} \\ b = -\frac{1}{l} \end{array}$$

$$N_1 = \frac{2}{l^2} x^2 - \frac{x}{l}$$



$$x = 0 \quad y = 1 \Rightarrow c = 1$$

$$\left. \begin{array}{l} x = \frac{l}{2} \quad y = 0 \Rightarrow a \frac{l^2}{4} + \frac{b l}{2} + 1 = 0 \\ x = -\frac{l}{2} \quad y = 0 \Rightarrow a \frac{l^2}{4} - \frac{b l}{2} + 1 = 0 \end{array} \right\} \begin{array}{l} a = -\frac{4}{l^2} \\ b = 0 \end{array}$$