1

1.1

$$A = \begin{vmatrix} 2\kappa & -\kappa & 2\epsilon & -\epsilon \\ -\kappa & \kappa & -\epsilon & \epsilon \\ 2\epsilon & -\epsilon & 2\delta & -\delta \\ -\epsilon & 2\delta & -\delta & \delta \end{vmatrix}$$

1.2

The final elongation x_1, will be the same as the combined effects of a force$F = 2N$ and a torque $T = 1Nm$. Thus the total elongation will be twice the elongation of $F = 1N$ and $T = 0Nm$ PLUS the elongation of$F = 0N$ and $T = 1Nm$.

Thus, because of linear combination, we have:

$$\begin{aligned} x_1 &= 2 * 1mm + 3mm \\ &\Rightarrow x_1 = 5mm. \end{aligned}$$