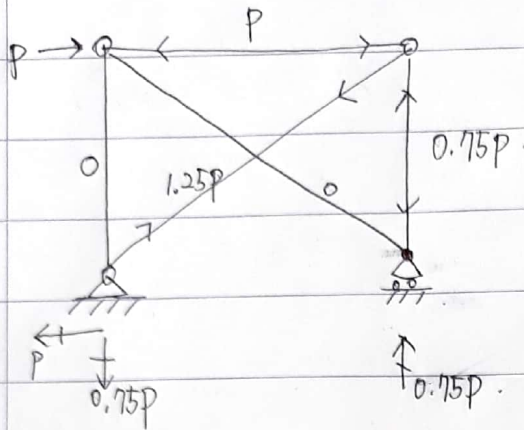
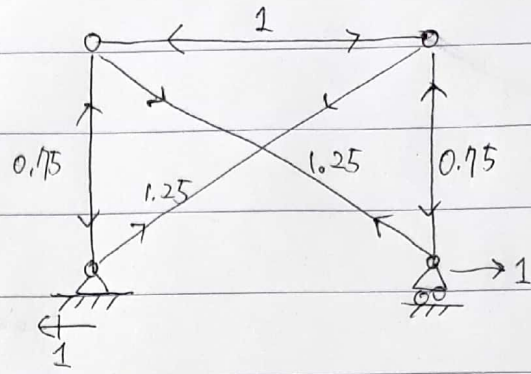


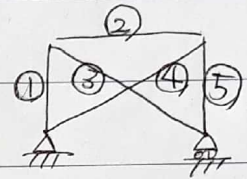
Prob. 2. Real system.



Virtual system.

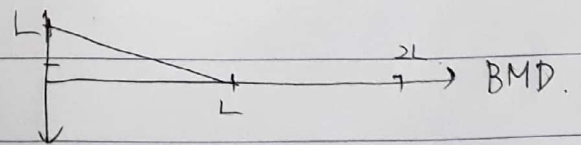
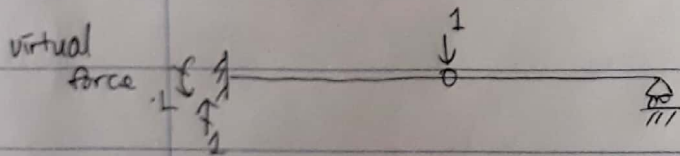
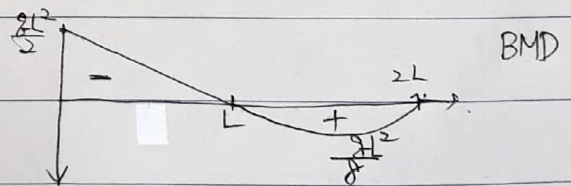
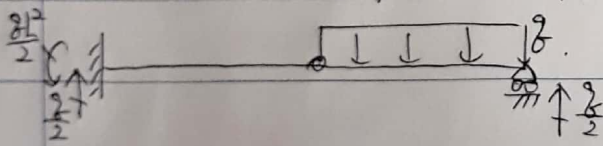


| Member   | $\frac{L}{EA}$ | F      | $\bar{F}$ | $\frac{F\bar{F}}{EA} L$ |
|----------|----------------|--------|-----------|-------------------------|
| 1        | 0.75           | 0      | -0.75     | 0                       |
| 2        | 1              | -P     | -1        | P                       |
| 3        | 1.25           | 0      | 1.25      | 0                       |
| 4        | 1.25           | 1.25P  | 1.25      | $\frac{125}{64} P$      |
| 5        | 0.75           | -0.75P | -0.75     | $\frac{27}{64} P$       |
| $\Sigma$ |                |        |           | $\frac{27}{8} P$        |



$$\therefore \delta = \frac{27}{8} P \frac{L}{EA} = \frac{27PL}{8EA} = 3.375 \frac{PL}{EA}$$

Prob 3. # of indeterminacy: 1, spring m/m.



compatibility Equation:  $\delta_{10} + V\delta_{11} = -\delta_{\text{spring}}$

$$\frac{8L^4}{6EI} + V \cdot \frac{L^3}{3EI} = -\frac{V}{k} \rightarrow V = \frac{-\frac{8L^4}{6EI}}{\left(\frac{L^3}{3EI} + \frac{1}{k}\right)} = \frac{k 8L^4}{2(kL^3 + 3EI)}$$

$$\therefore \delta_{\text{spring}} = -\frac{8L^4}{2(kL^3 + 3EI)} \quad (\downarrow)$$