

$$\begin{aligned}
 \textcircled{1} \quad EI \cdot \Delta_A &= \int_0^6_{E \rightarrow D} \{16.45 \cdot x \cdot x\} \{-1 \cdot x\} dx + \int_0^6_{D \rightarrow C} \{16.45(6+x) - 50x\} \{-1(x+6)\} dx \\
 &+ \int_0^6_{C \rightarrow B} \{16.45(12+x) - 50(6+x) + 44.95x\} \{-1(x+2) + 2x\} dx \\
 &+ \int_0^6_{B \rightarrow A} \left\{ 16.45 \cdot (18+x) - 50(12+x) + 44.95(x+6) - \frac{1.9x^2}{2} \right\} \\
 &\quad \{-1(x+18) + 2(x+6)\} dx
 \end{aligned}$$

$$= -1184.4 + 709.2 + 3898.8 + 307.8$$

$$= 3731.4$$

$$\therefore \Delta_{A0} = \frac{3731.4}{EI} \text{ N.m}^3$$

$$\begin{aligned}
 \textcircled{2} \quad EI \cdot \Delta_A &= \int_0^6 \overset{E \rightarrow D}{\{1645x\}} \{-1x\} dx + \int_0^6 \overset{D \rightarrow C}{\{1645(x+6) - 50x\}} \{-1(x+6)\} dx \\
 &+ \int_0^6 \overset{B \rightarrow C}{\{-114(x+3)\}} \{-1(x+6)\} dx + \int_0^6 \overset{A \rightarrow B}{\{-\frac{19x^2}{2}\}} \{-1x\} dx \\
 &= -1184.4 + 709.2 + 3898.8 + 307.8 \\
 &= 3731.4
 \end{aligned}$$

$$\therefore \Delta_{A0} = \frac{3731.4}{EI} \text{ N.m}^3.$$

$$\begin{aligned}
 EI \cdot \delta_{AA} &= \int_0^{12} \overset{E \rightarrow C}{(-1x)^2} dx + \int_0^{12} \overset{A \rightarrow C}{(-1x)^2} dx \\
 &= 526 + 526 \\
 &= 1152
 \end{aligned}$$

$$\therefore \delta_{AA} = \frac{1152}{EI} \text{ N.m}^3.$$

$$\therefore R_A = - \frac{3731.4/EI}{1152/EI}$$

$$= -3.24 \text{ N.} \quad \therefore R_A = 3.24 \text{ upward.}$$

$$\sum M_c = 0, \quad \uparrow +$$

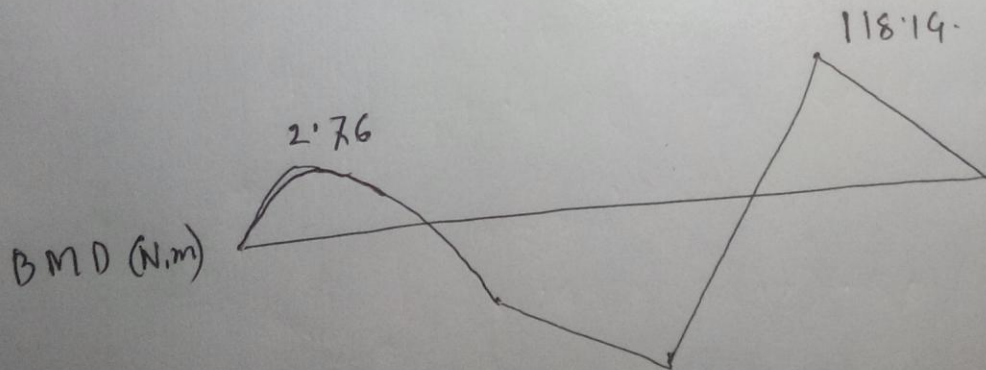
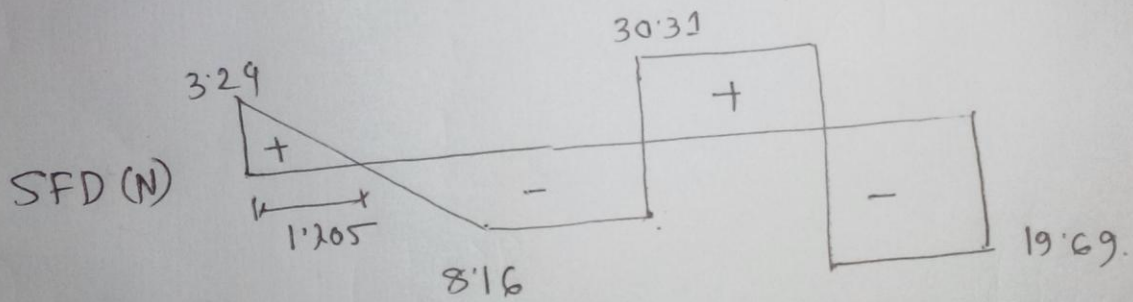
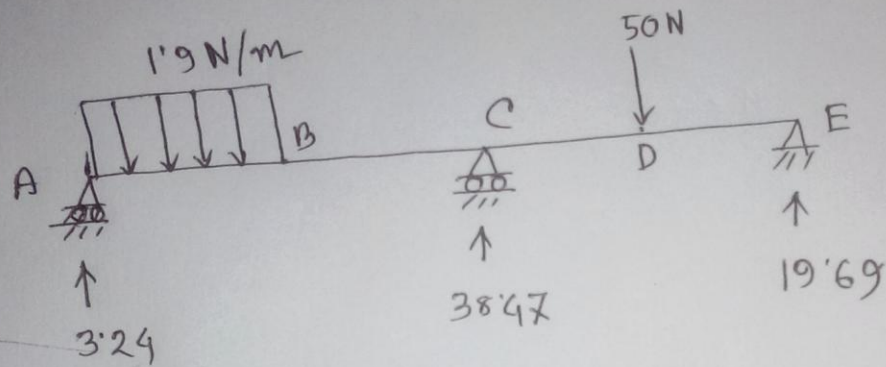
$$50 \times 6 - E_y \times 12 - 114 \times 9 + 3.24 \times 12 = 0$$

$$\therefore E_y = 19.69 \text{ N } \uparrow$$

$$\sum F_y = 0, \uparrow +$$

$$\therefore 3.24 - 11.4 + c_y - 50 + 19.69 = 0$$

$$\therefore c_y = 38.47 \text{ N. } \uparrow$$



Credit: Wakil Ahmed