MEEG 3013 Quiz #9

A beam with constant flexural rigidity $EI$ is supported and loaded as shown. Using **moment-area theorems**, determine for this beam (a) the reaction $A_y$ at $A$, (b) the slope $\theta_A$ at $A$, (c) the slope $\theta_C$ at $C$, (d) the deflection $y_C$ at $C$.

\[ t_{A/B} = (M_A)_{AB} = 0 \]
\[ \theta_B = 0 \]
\[ \theta_{B/A} = A_{AB} = \theta_B - \theta_A = -\theta_A \]
\[ \theta_{B/C} = A_{CB} = \theta_B - \theta_C = -\theta_C \]

\[ t_{C/A} = +\bigtriangledown (M_C)_{AC} = \frac{7w_0L^4}{6144EI} \]

\[ A_y = \frac{7w_0L}{128} \quad (1) \]
\[ \theta_A = -\frac{5w_0L^3}{768EI} \quad (1) \]
\[ \theta_C = \frac{w_0L^3}{3072EI} \quad (1) \]

\[ y_C = -\left(\frac{L}{2} \cdot |\theta_A| - t_{C/A}\right) \quad (1) \]
\[ y_C = -\frac{13w_0L^4}{6144EI} \quad (1) \]