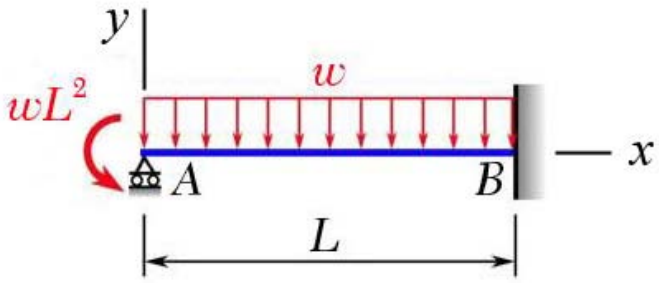
MEEG 3013 Quiz #8.m33.091

The beam shown has a constant flexural rigidity *EI*. Using **singularity functions**, determine for this beam (*a*) the reaction $\mathbf{A}_y$ at *A*, (*b*) the slope y'_A at *A*.



$$q = -wL^2\langle x\rangle^{-2} + A_y\langle x\rangle^{-1} - w\langle x\rangle^{0}$$

$$V = -wL^2\langle x\rangle^{-1} + A_y\langle x\rangle^{0} - w\langle x\rangle^{1}$$

$$M = EIy'' = -wL^2\langle x\rangle^{0} + A_y\langle x\rangle^{1} - \frac{w}{2}\langle x\rangle^{2}$$

$$EIy' = -wL^2\langle x\rangle^{1} + \frac{A_y}{2}\langle x\rangle^{2} - \frac{w}{6}\langle x\rangle^{3} + C_1$$

$$EIy = -\frac{wL^2}{2}\langle x\rangle^{2} + \frac{A_y}{6}\langle x\rangle^{3} - \frac{w}{24}\langle x\rangle^{4} + C_1 x + C_2$$

②

B.C.'s: $y(0) = 0$ ① $y(L) = 0$ ① $y'(L) = 0$ ①

$A_y = \frac{15wL}{8}$ ① $C_1 = \frac{11wL^3}{48}$ ① $C_2 = 0$ ①

$\mathbf{A}_y = \frac{15wL}{8}\uparrow$ ① $y'_A = \frac{11wL^3}{48EI}$ ①