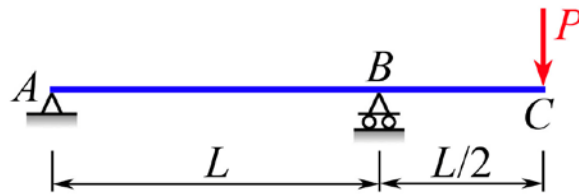


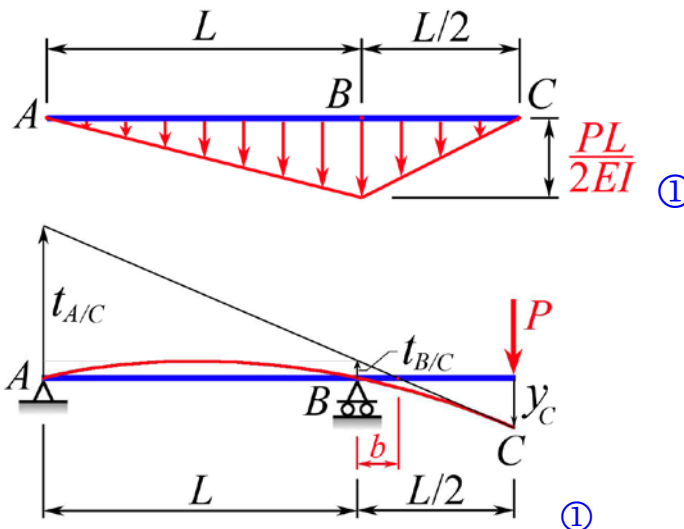
MEEG 3013 Quiz #9.m37.101

1. ⑧ A beam with constant flexural rigidity EI is supported and loaded as shown. Using **moment-area theorems**, determine for this beam (a) the slope θ_C at C, (b) the deflection y_C at C.



2. ② Define for a force (a) the **moment center**, (b) the **moment arm**.

1.



$$t_{A/C} = +\circlearrowleft (M_A)_{AC} = \frac{15PL^3}{48EI} \quad \text{①} \qquad t_{B/C} = +\circlearrowleft (M_B)_{BC} = \frac{PL^3}{48EI} \quad \text{①}$$

$$\frac{b}{L+b} = \frac{t_{B/C}}{t_{A/C}} \qquad b = \frac{L}{14} \quad \text{①} \qquad \theta_C = -\frac{t_{A/C} - t_{B/C}}{L} \quad \text{①} \qquad y_C = \left(\frac{L}{2} - b \right) \theta_C$$

$$\theta_C = -\frac{7PL^2}{24EI} \quad \text{①} \qquad y_C = -\frac{PL^3}{8EI} \quad \text{①}$$

2. (a) The **moment center** is the *point* about which the moment of the force is computed. ① (b) The **moment arm** is the *shortest distance* from the moment center to the line of action of the force. ①