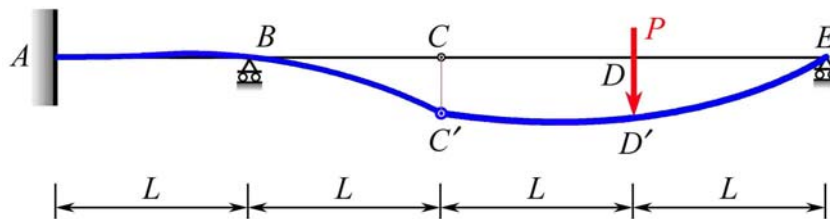
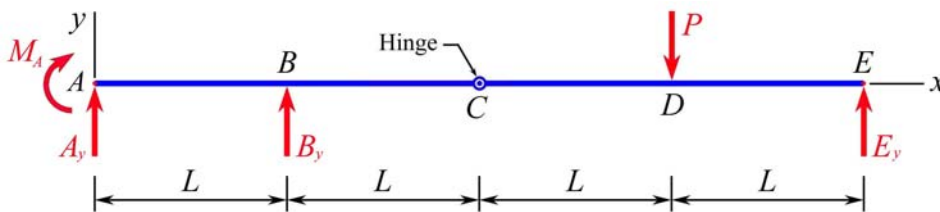
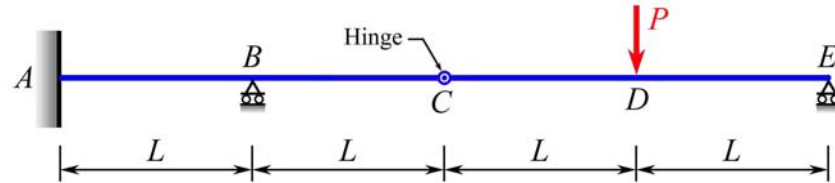


[MEEG Quiz 4.1m.081](#) A Gerber beam (*Gerberbalken*) with total length $4L$ has a hinge connection at C and constant flexural rigidity EI in its segments ABC and CDE . This beam is supported and loaded with a concentrated force $P \downarrow$ at D as shown. Determine (a) the slopes θ_B , θ_D , and θ_E at B , D , and E , respectively; (b) the slope $(\theta_C)_l$ just to the left of C ; (c) the slope $(\theta_C)_r$ just to the right of C ; (d) the deflection y_C at C ; (e) the deflection y_D at D .



$$M_A = \frac{PL}{4} \curvearrowright$$

$$A_y = \frac{3P}{4} \downarrow$$

$$E_y = \frac{5P}{4} \uparrow$$

$$\theta_B = \frac{PL^2}{8EI} \curvearrowright = \frac{6PL^2}{48EI} \curvearrowright$$

$$\theta_D = \frac{7PL^2}{48EI} \curvearrowright$$

$$\theta_E = \frac{19PL^2}{48EI} \curvearrowright$$

$$(\theta_C)_l = \frac{3PL^2}{8EI} \curvearrowright = \frac{18PL^2}{48EI} \curvearrowright$$

$$(\theta_C)_r = \frac{5PL^2}{48EI} \curvearrowright$$

$$y_C = \frac{7PL^3}{24EI} \downarrow$$

$$y_D = \frac{5PL^3}{16EI} \downarrow$$