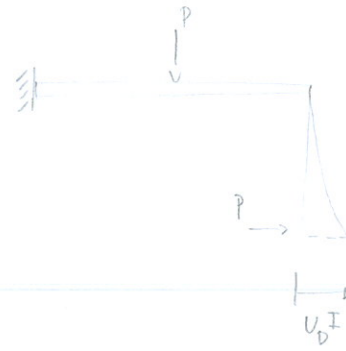
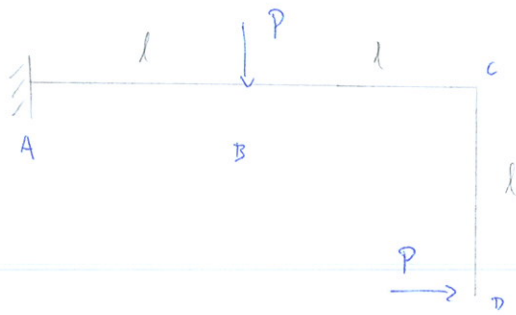
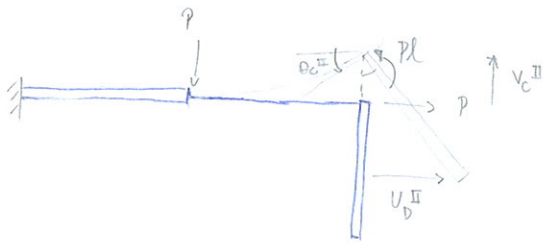


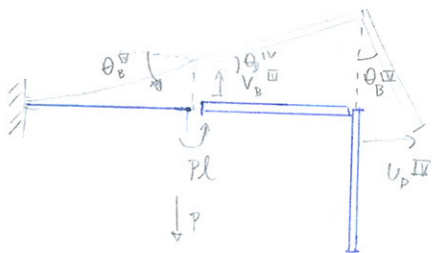


$$U_D^I = \frac{Pl^3}{3EI}$$



$$\theta_C^{II} = \frac{(Pl) \cdot l}{EI} = \frac{Pl^2}{EI}$$

$$U_D^{II} = \theta_C^{II} \cdot l = \frac{Pl^3}{EI}$$



$$V_B^{IV} = \frac{Pl \cdot l^2}{2EI} - \frac{Pl^3}{3EI} = \frac{3Pl^3}{6EI} - \frac{2Pl^3}{6EI} = \frac{Pl^3}{6EI}$$

$$\theta_B^{IV} = \frac{Pl \cdot l}{EI} - \frac{Pl^2}{2EI} = \frac{Pl^2}{2EI}$$

$$U_D^{IV} = \theta_B^{IV} \cdot l = \frac{Pl^3}{2EI}$$

$$\therefore U_D = U_D^I + U_D^{II} + U_D^{IV} = \frac{Pl^3}{3EI} + \frac{Pl^3}{EI} + \frac{Pl^3}{2EI} = \frac{2Pl^3}{6EI} + \frac{6Pl^3}{6EI} + \frac{3Pl^3}{6EI} = \frac{11Pl^3}{6EI}$$