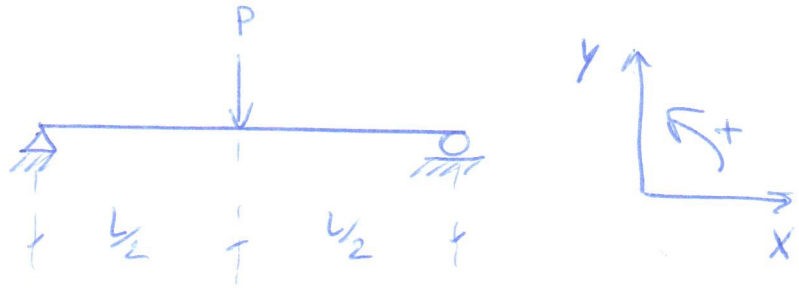
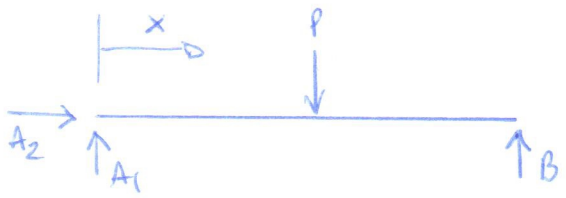
14.32:





$\Sigma F_y = 0$: $A_1 + B = 0 \Rightarrow A_1 = -B = -\frac{P}{2}$

$\Sigma M_A = 0$: $-P\cdot\frac{L}{2} + B\cdot L = 0 \Rightarrow P = \frac{B\cdot L\cdot 2}{L} = 2B$

Moment line:

$$M(x) = A_1\cdot x - P\left(x-\frac{L}{2}\right)\delta\left(x-\frac{L}{2}\right)$$

$$= -\frac{P}{2}\cdot x - P\left(x-\frac{L}{2}\right)\delta\left(x-\frac{L}{2}\right) = -\frac{P}{2}x - Px + \frac{PL}{2} = \frac{3}{2}P\cdot x + \frac{PL}{2}$$

$$M^2(x) = \frac{9}{4}P^2x^2 + \frac{P^2L^2}{2} + \frac{3}{2}\cdot P^2\cdot L\cdot x$$

energy formula: $W = \int \frac{M^2}{2EI}\,dx$

$$W = P^2\frac{1}{2EI}\int\left(\frac{9}{4}x^2 + \frac{L^2}{2} + \frac{3}{2}Lx\right)dx$$

$$= \frac{P^2}{2EI}\left[\frac{9}{4\cdot 3}x^3 + \frac{L^2}{2}x + \frac{3}{2}\frac{L\cdot x^2}{2}\right]_0^L$$

$$= \frac{P^2}{2EI}\left[\frac{9}{12}L^3 + \frac{L^3}{2} + \frac{3}{4}L^3\right] = \frac{4L^3P^2}{4EI} = \frac{L^3P^2}{EI}$$

displacement: $y = \frac{dW}{dF} = \frac{2P\cdot L^3}{EI}$