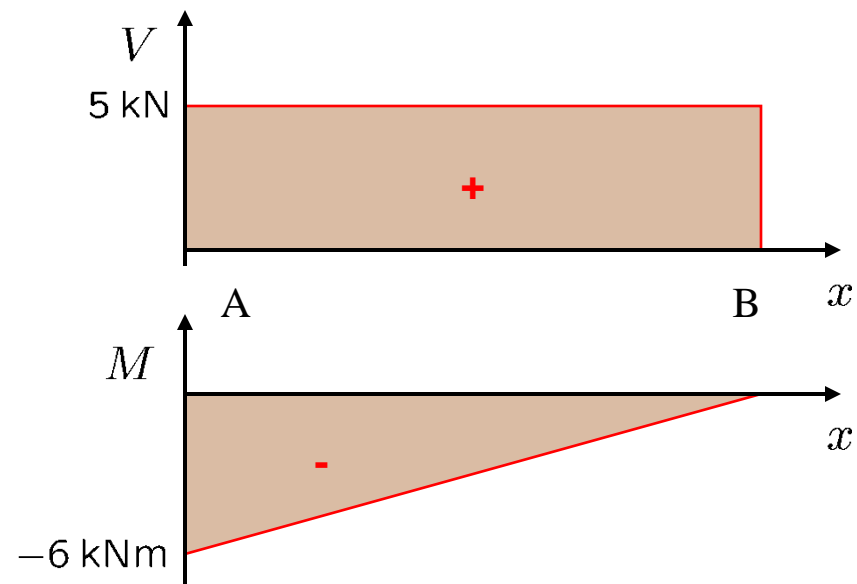
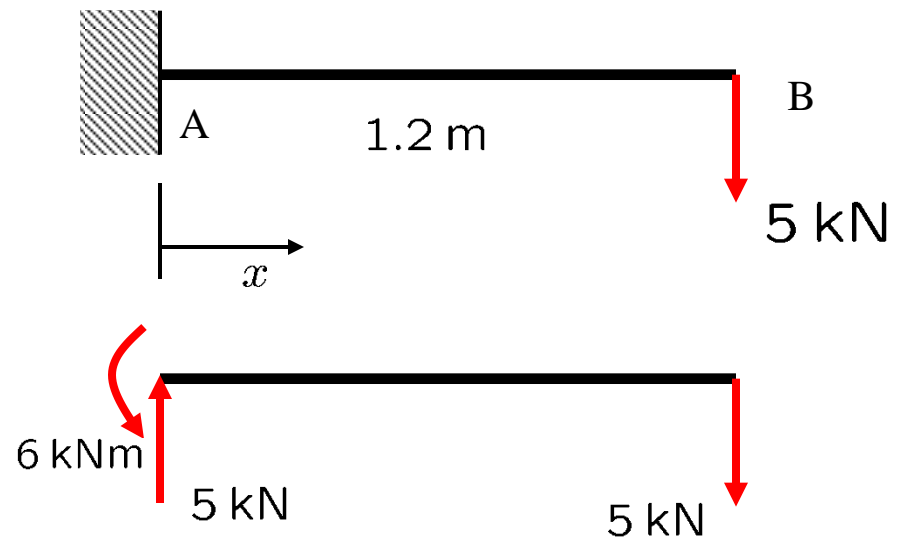
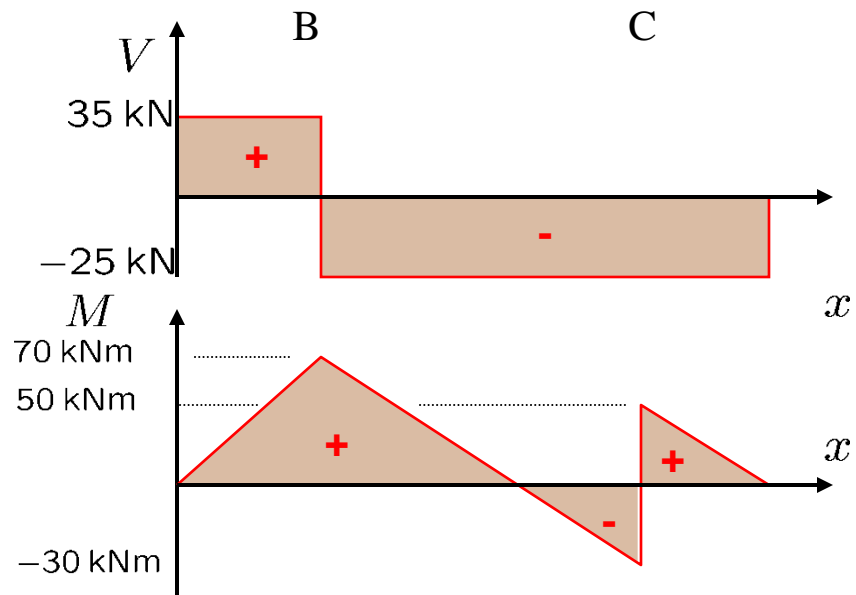
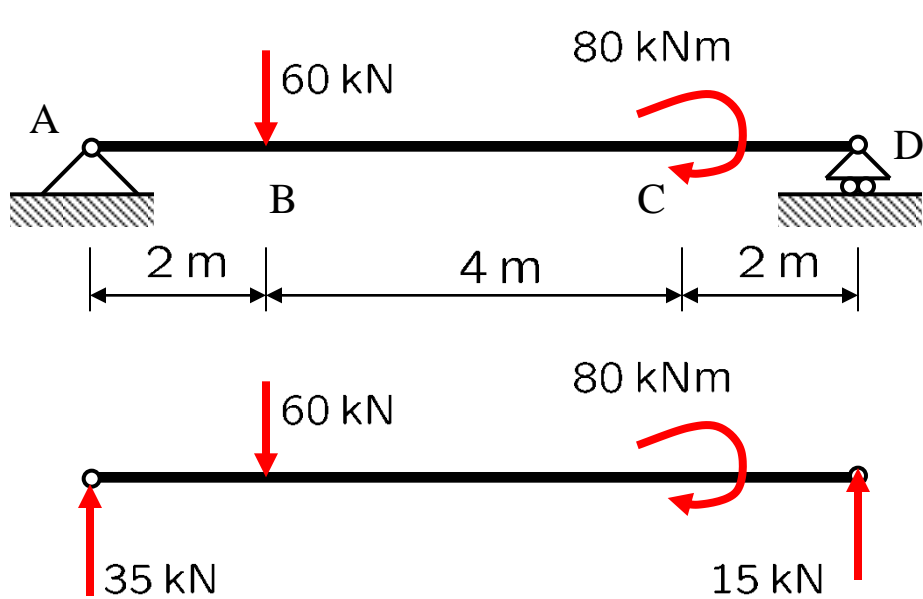


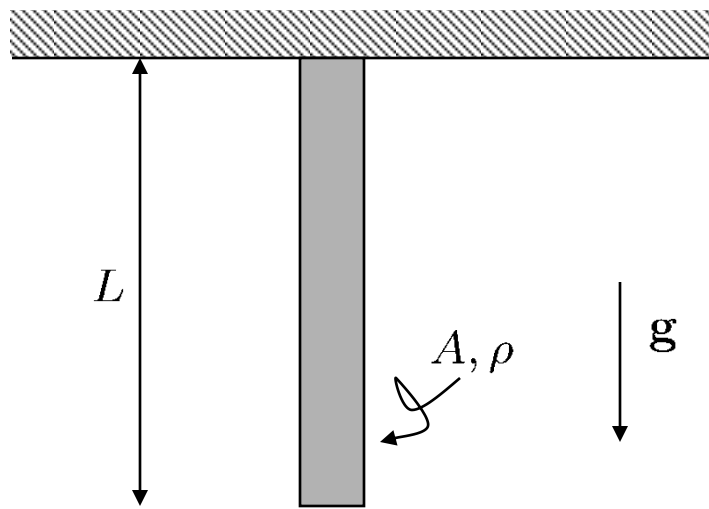
Today:

Internal effects in beams continued

Book: Chapter 7.1-7.3 + hand outs

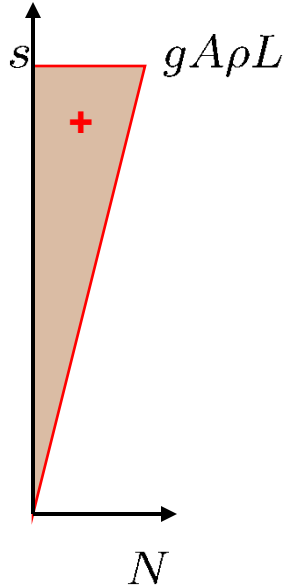
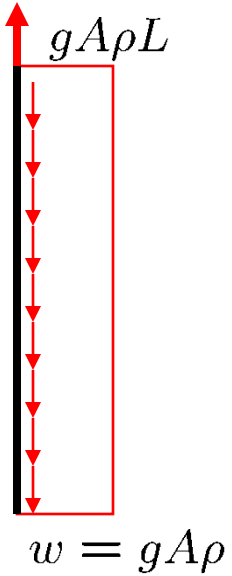
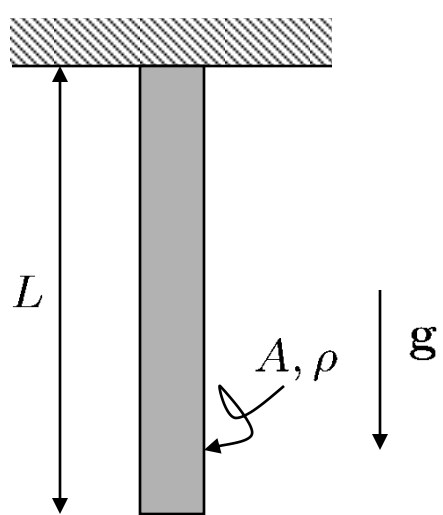


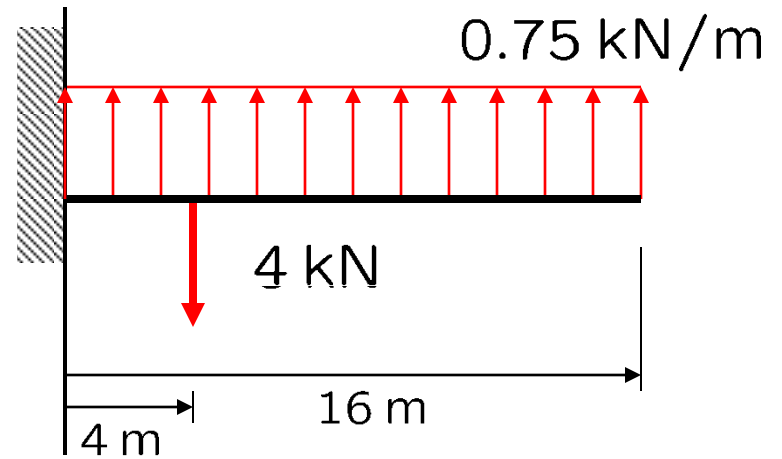
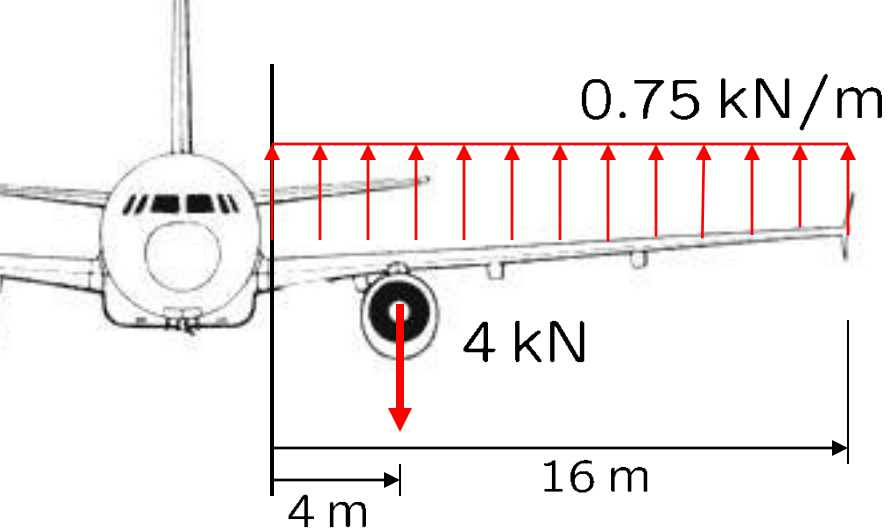




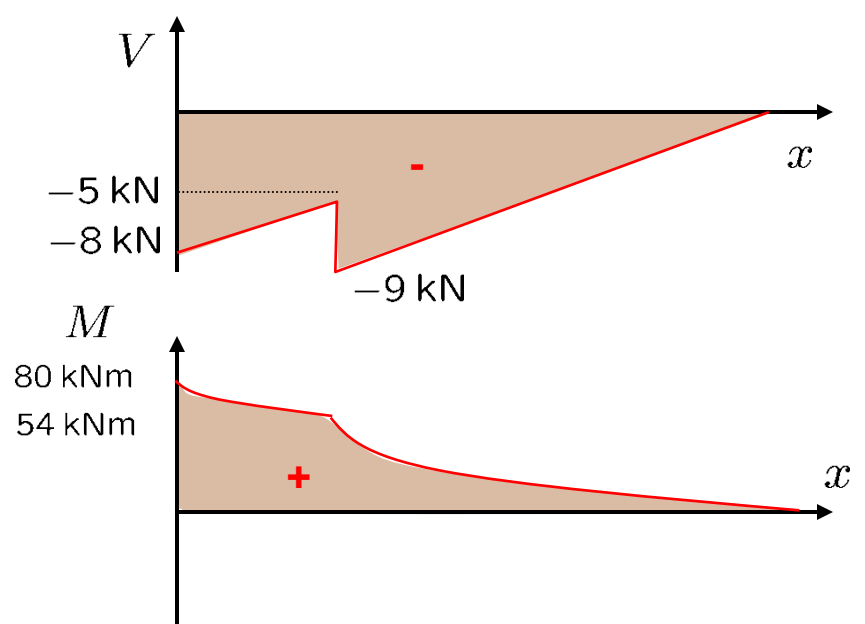
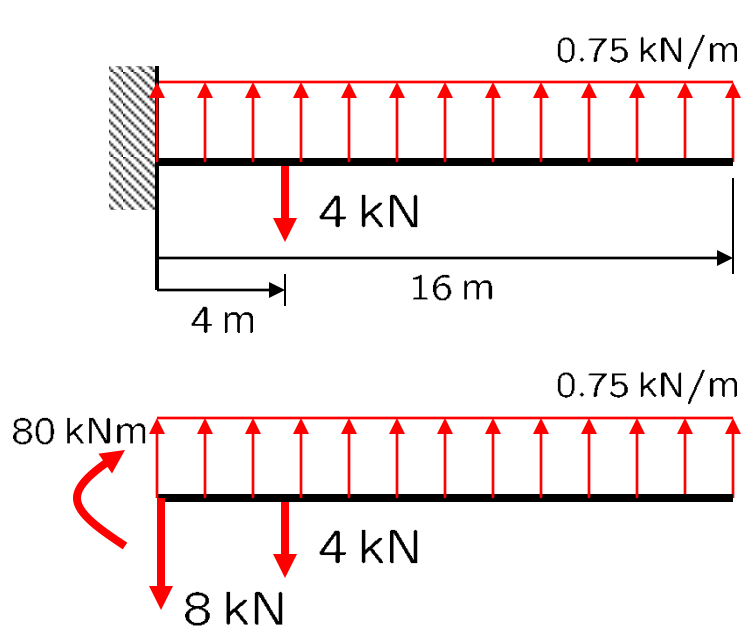
Determine the normal force diagram in the bar with length L , cross-section A and density ρ due its own weight.

Bonus: The column is made of steel, $\rho=7800 \text{ kg/m}^3$ with an ultimate stress $\sigma_u=400 \text{ MPa}$. For what length L will the beam fail due to its own weight?

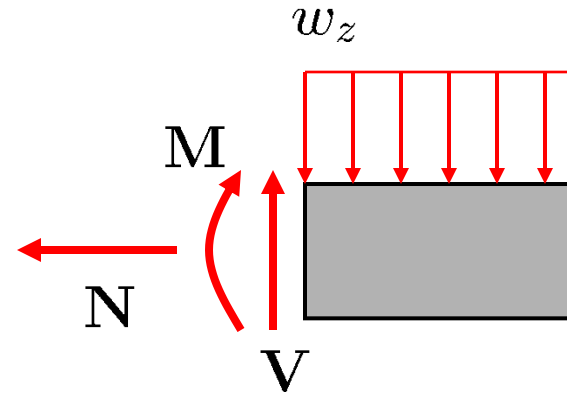
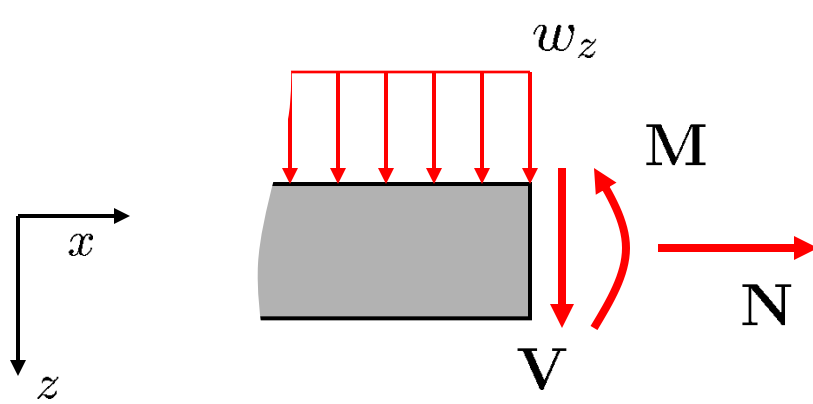




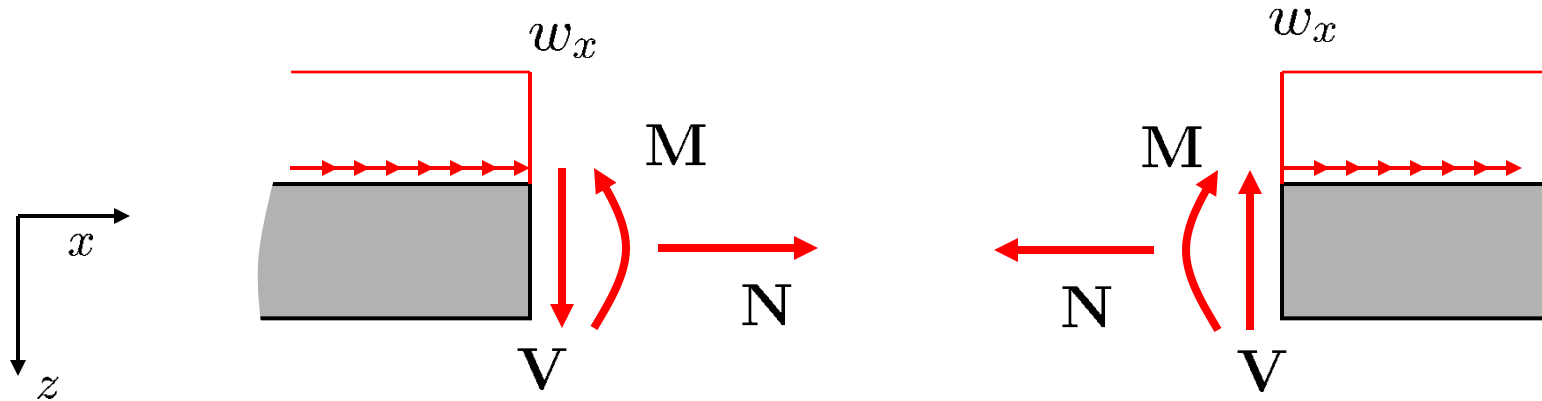
Determine the shear force and moment diagram of the wing of this airplane.

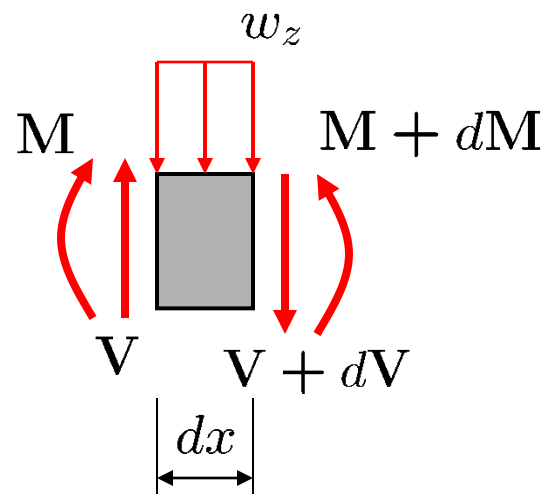
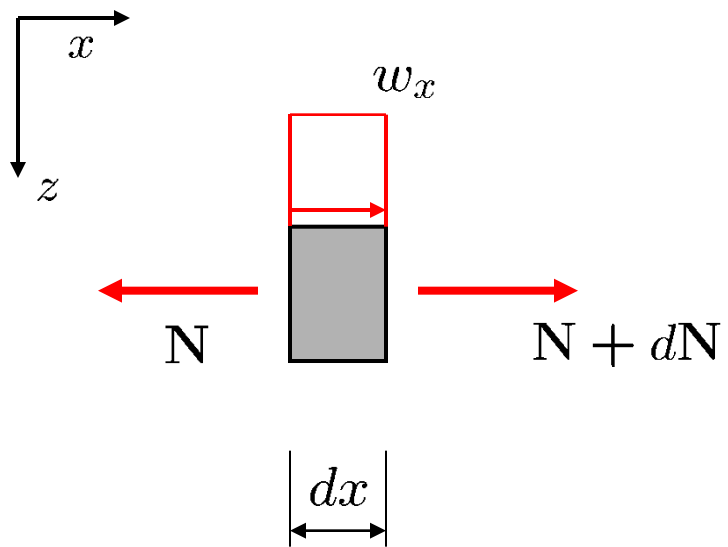


Sign convention



Sign convention

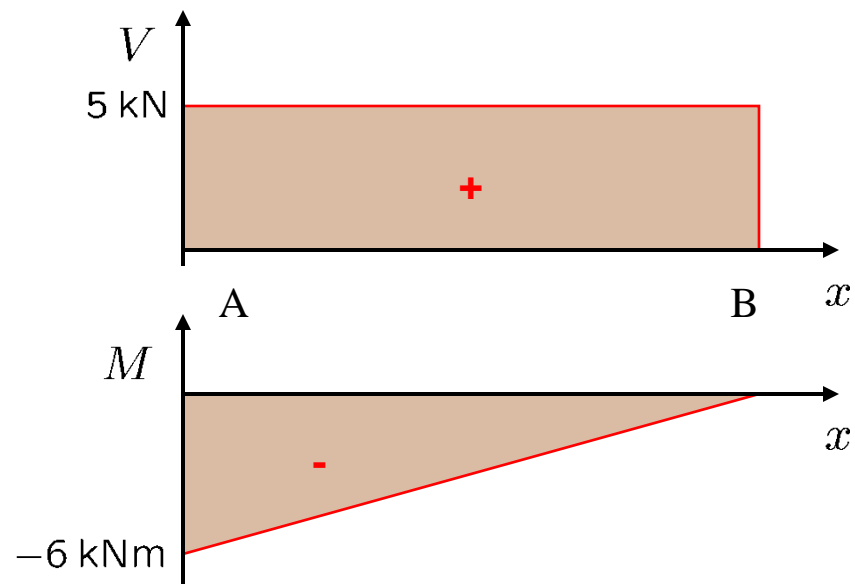
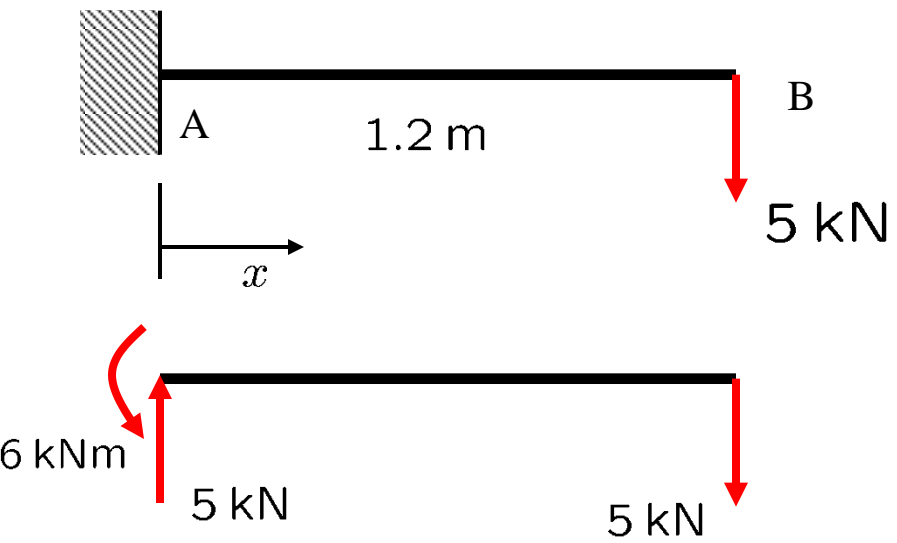


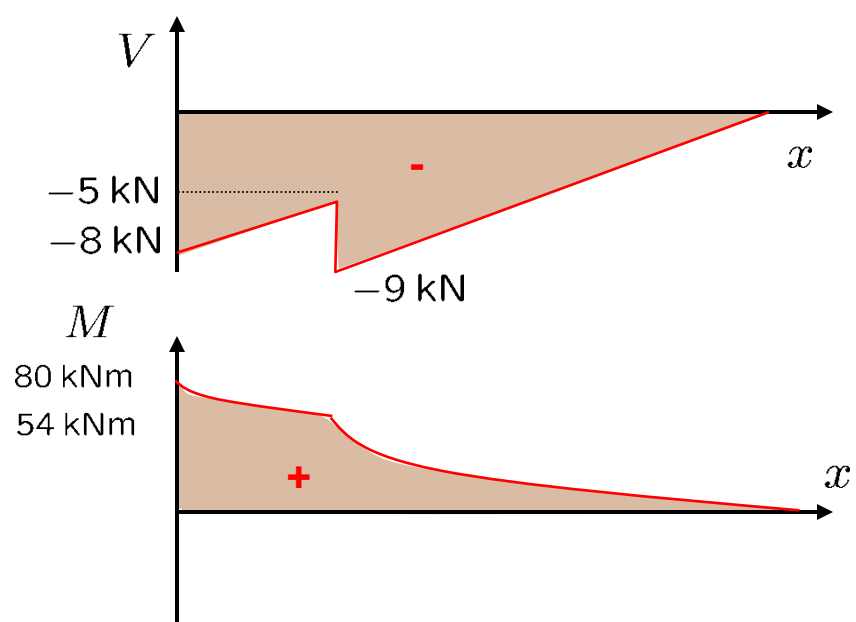
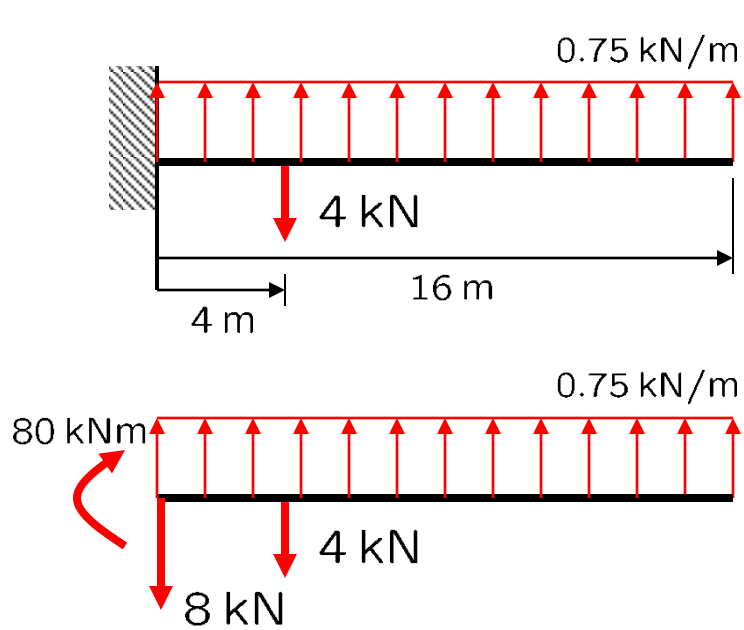


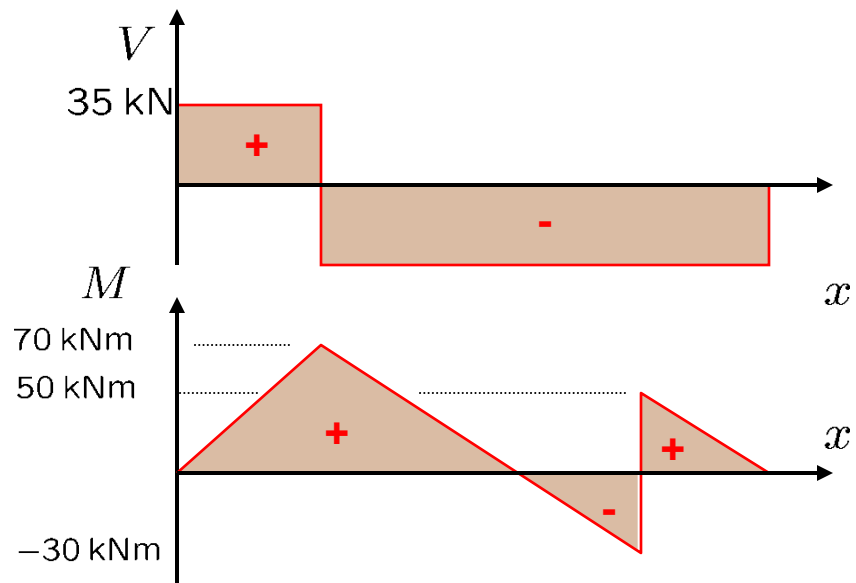
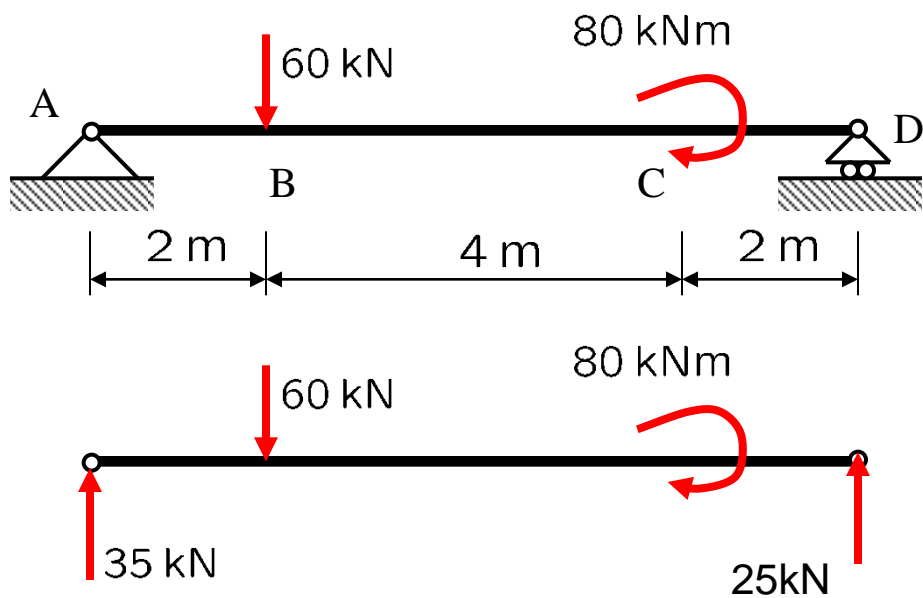
$$\frac{dN}{dx} = -w_x$$

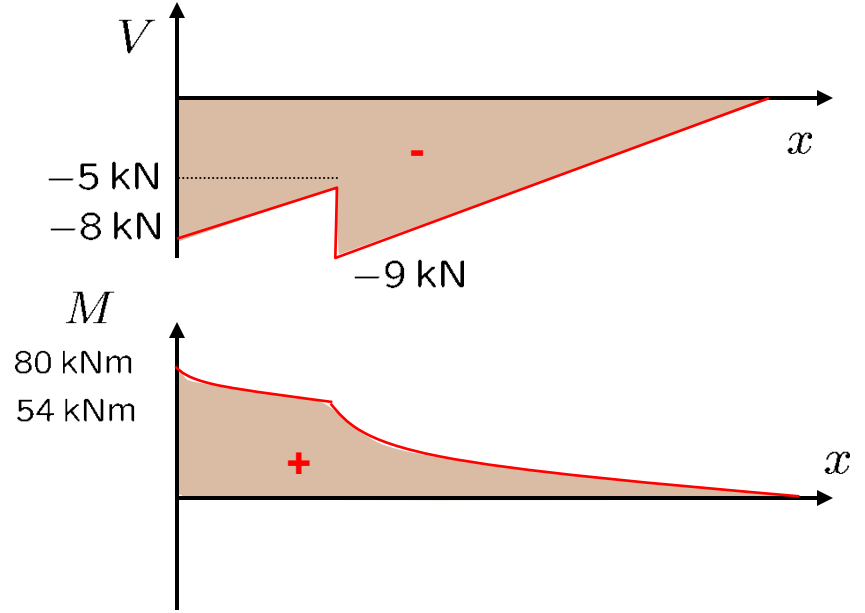
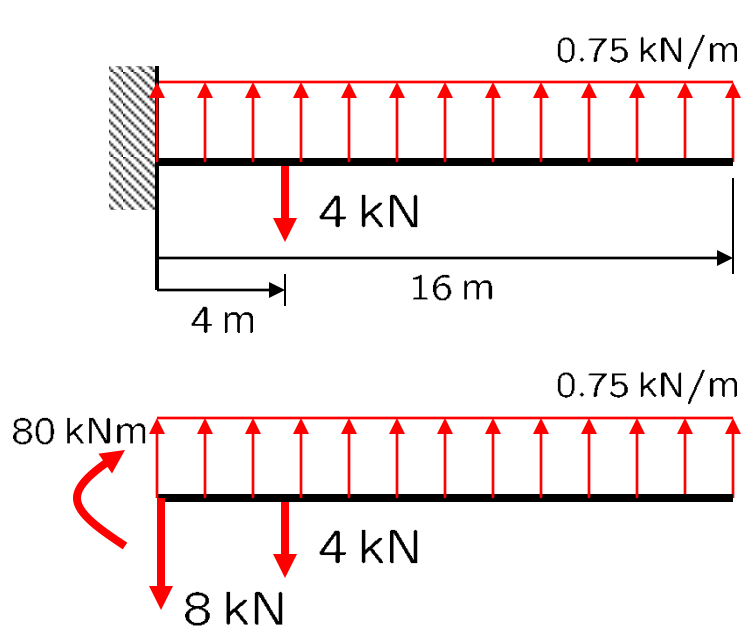
$$\frac{dV}{dx} = -w_z$$

$$\frac{dM}{dx} = V$$



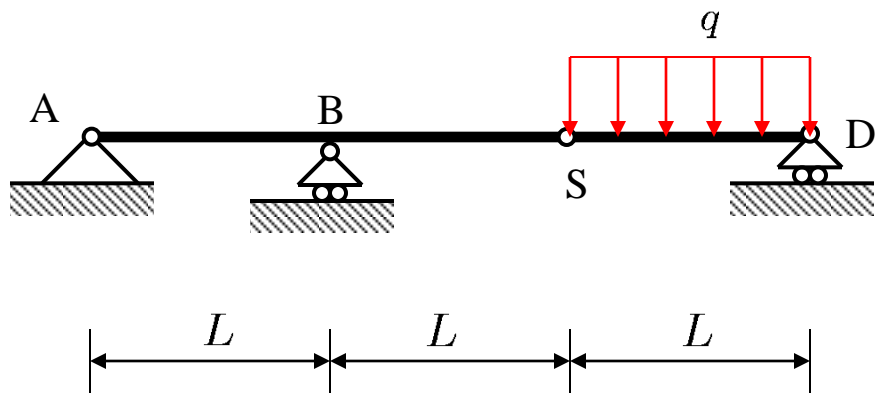






Course Hand-out

rules.pdf



Determine the shear force and moment diagram of this structure. Note that S is a hinge.

