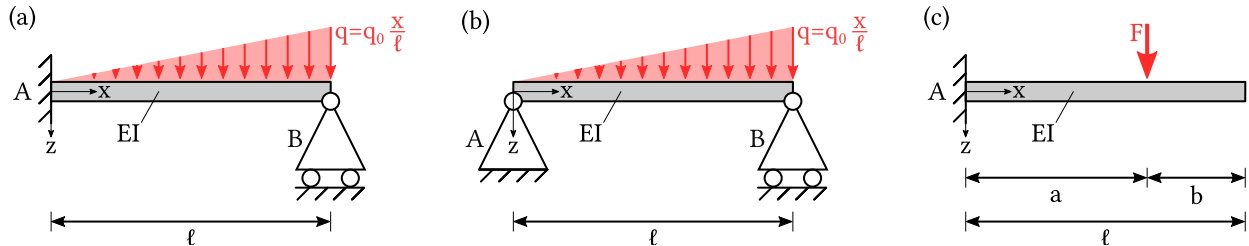


Exercise 10: Bending and buckling

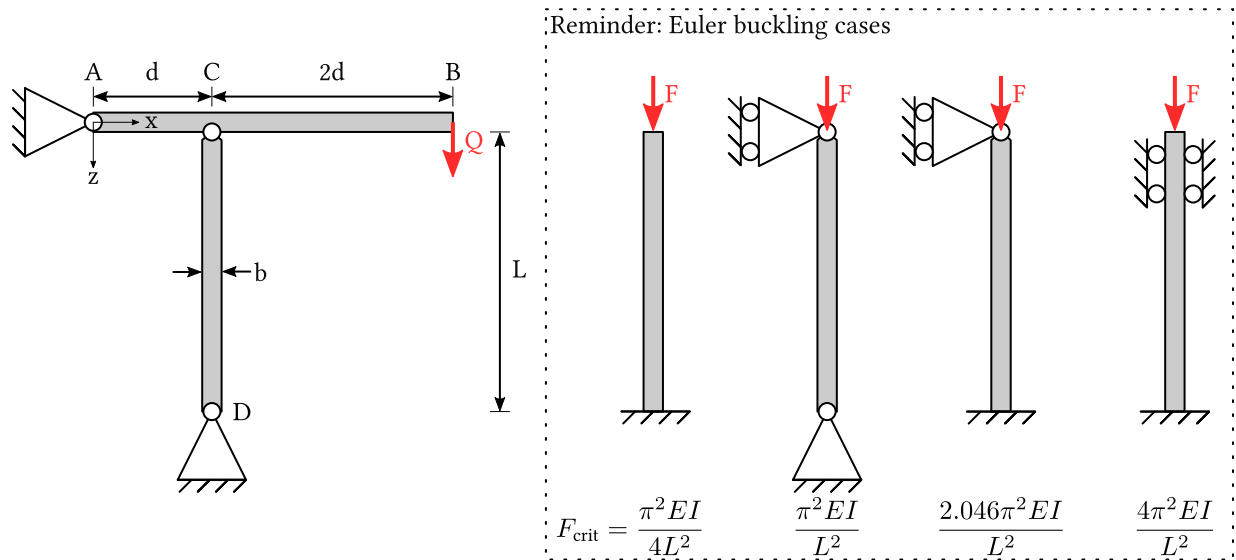
18.12.2023 - 22.12.2023

Question 1
 Determine if the following structures are statically determinate! Calculate the deflection and the reaction forces and moments at the supports!



Question 2
 Reference: Gere and Timoshenko, Mechanics of Materials, 4th ed., PWS Publishing Company (p. 789)

A horizontal beam AB is supported by a pinned-end column CD , as shown in the figure. The column is a solid steel bar (Young's modulus $E = 200 \text{ GPa}$) of square cross-section having length $L = 1.8 \text{ m}$ and side dimensions $b = 50 \text{ mm}$. For safety reasons, the normal force in column CD should not exceed *half* the critical buckling force F_{crit} . Determine the maximum allowable force Q !



Question 3
 Calculate the second moment of area I_y for a regular hexagon:

