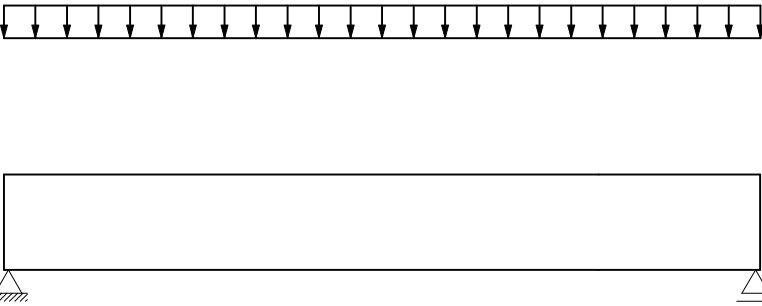


Task 1 Internal Force Distribution in a Cantilevered Beam

For cases a) and d) draw a possible solution for the distribution of the internal forces by means of an arch-cable structure. For b) and c) the internal forces are given. Draw the force diagrams for all cases and use red for tension forces and blue for compression.

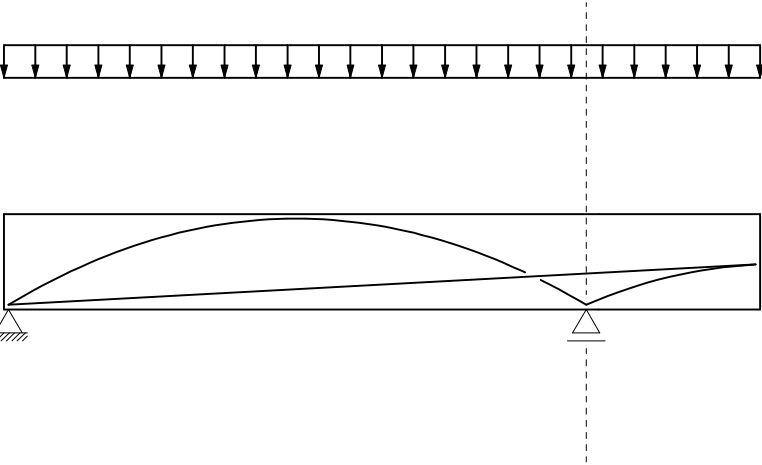
a)



form diagram 1:100

force diagram 1cm ≙ 10kN

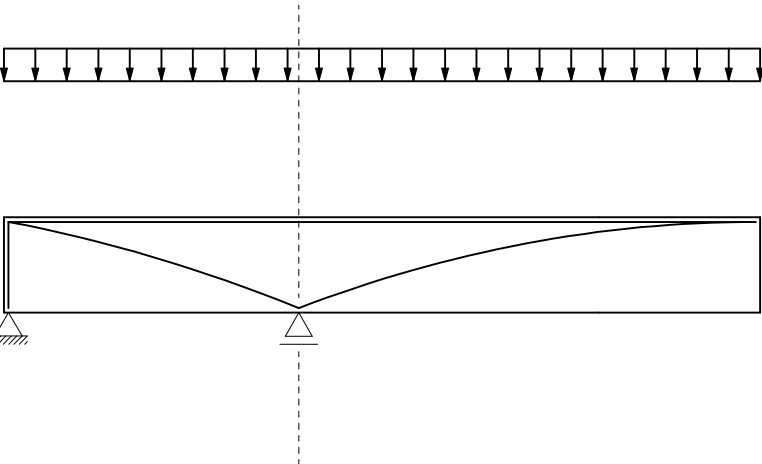
b)



form diagram 1:100

force diagram 1cm ≙ 10kN

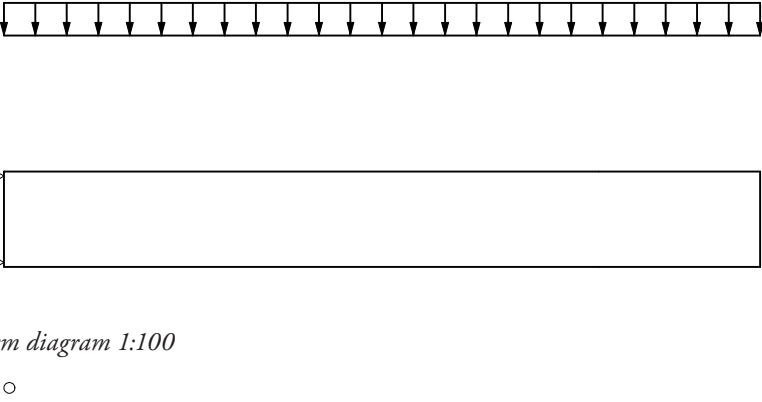
c)



form diagram 1:100

force diagram 1cm ≙ 10kN

d)

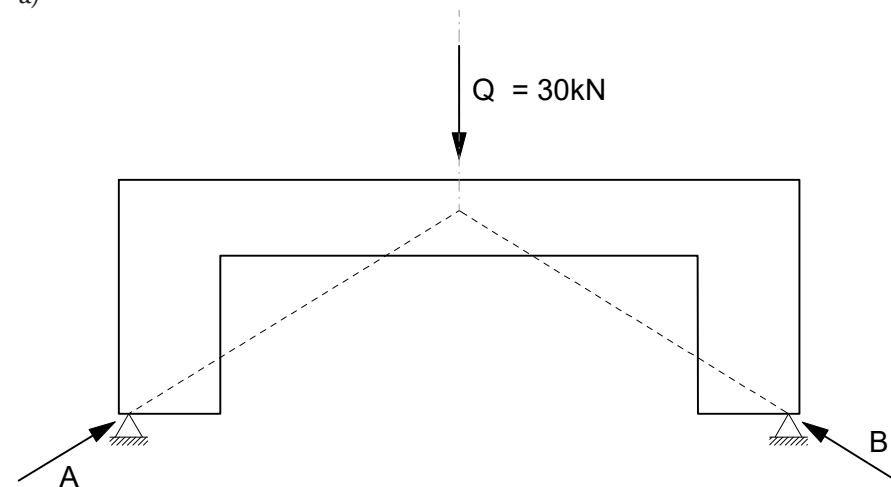


**Task 2 Statically indetermined supported frame**

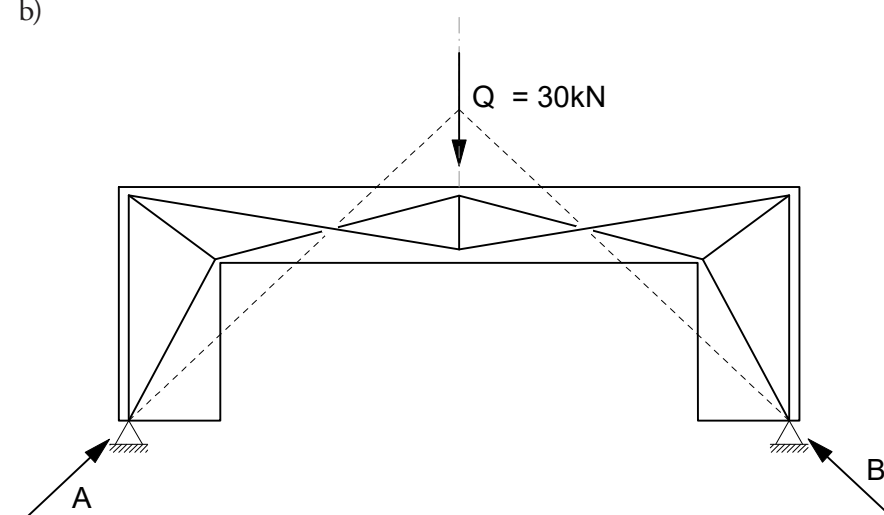
Two equal frames in reinforced concrete with different supports are given. In situation a) draw a possible internal force distribution as an arch-cable-construction with the aid of the force diagram.

Draw the corresponding force diagram to the given force distribution in b). Indicate in both a) and b) tension forces with red and compression forces with blue.

a)

*form diagram 1:100**force diagram 1cm ≙ 10kN*

b)

*form diagram 1:100**force diagram 1cm ≙ 10kN*

- Dimension the reinforcement within the steel concrete for the relevant tension force of task 2 a). Use steel S235 to calculate the diameter and round the result off to mm. (Round up!)
- Verify whether the frame in task 2 b) can keep up with the relevant compression force. The slab is 8 cm thick and is constructed in concrete C12/15. Presume the force would affect the frame over the width of 10 cm.