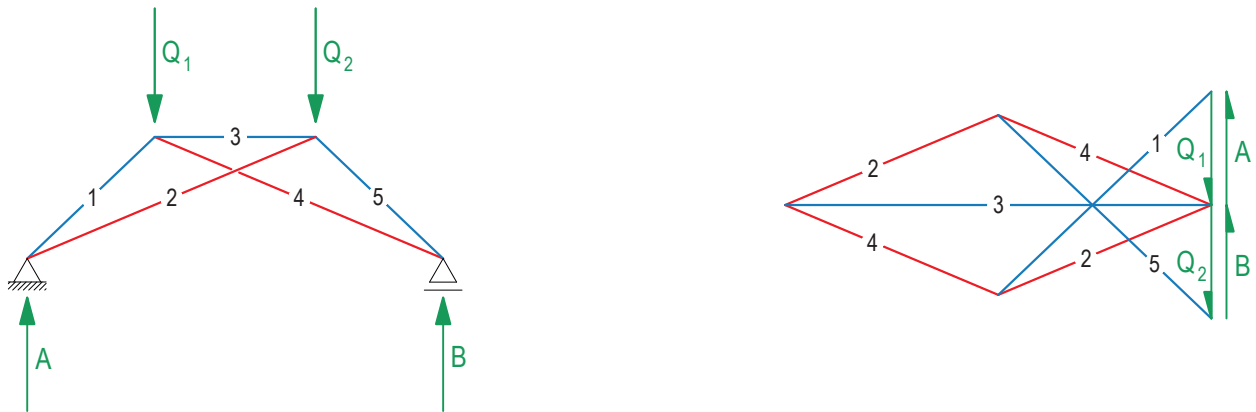


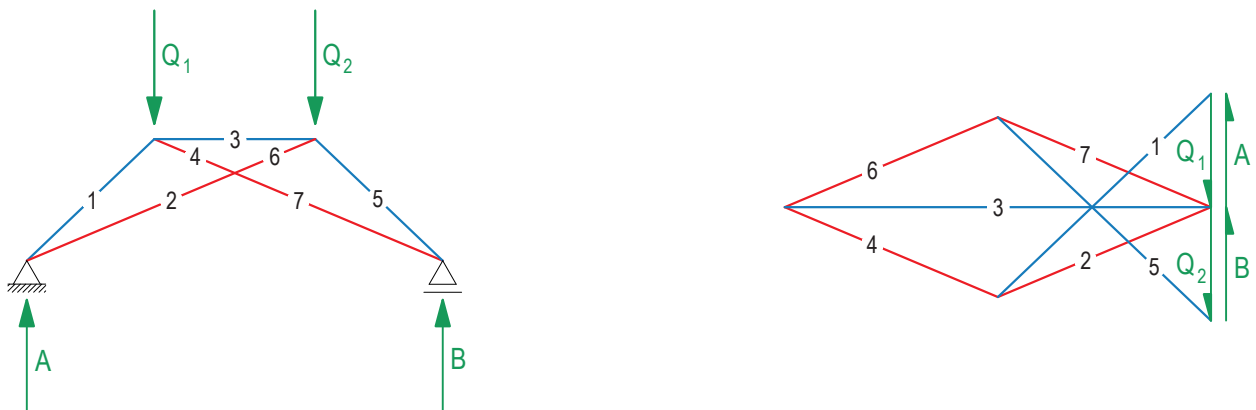
7.1

Intersecting Elements

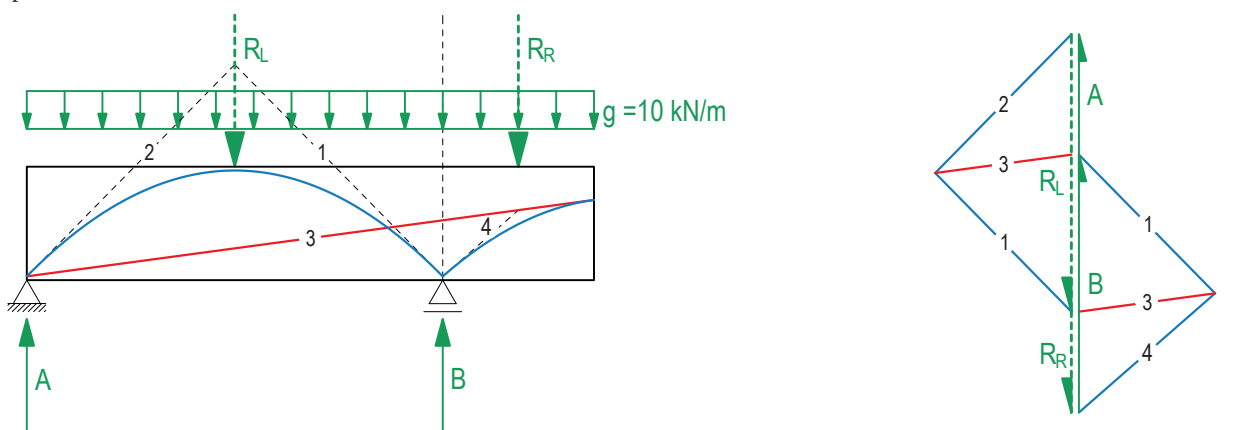
In general, the following applies in graphic statics: An element in the form diagram has one corresponding line in the force diagram. However, this is only the case as long as the elements in the form diagram do not intersect or overlap. An intersection is a fictitious node in which the elements cross in two-dimensional space but pass each other in the third dimension. Intersecting members must be drawn twice in the force diagram to create closed force polygons.



In the example above, the intersecting elements 2 and 4 form a parallelogram, i.e. a polygon with four sides in the force diagram. This intersection can alternatively be considered as a node with four elements in two-dimensional space. The node in the example below then consists of the elements 2, 4, 6 and 7, whereby 2 and 6, as well as 4 and 7, each take the same force, especially as they are each the same element in three-dimensional space. Meanwhile, nothing changes in the force diagram except the labelling.



Similar to the example above, intersections also occur with uniformly distributed loads. In the following example, the right tangent of the parabola (1) overlaps with the tension element (3). Accordingly, both elements appear twice in the force diagram. In addition, the tension element and the right tangent of the half parabola overlap at the extreme right end of the beam. Both elements have the same force in opposite directions and lie on top of each other in the form diagram, which is why we speak of an overlap.



form diagrams 1:100

force diagrams 1cm $\hat{=}$ 15kN