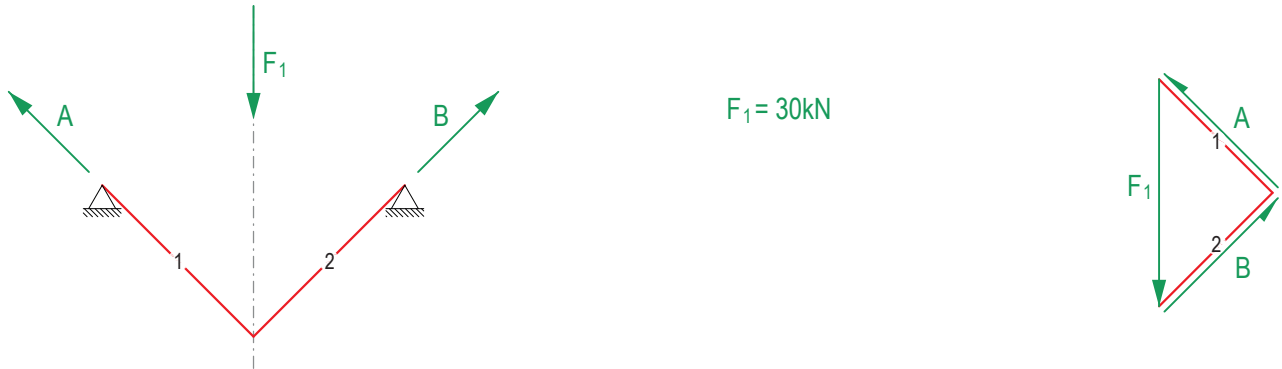


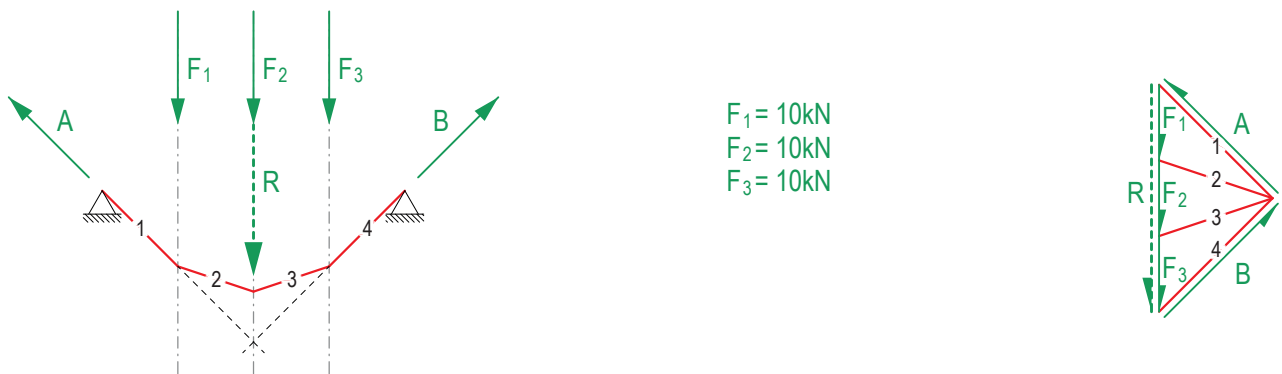
3.1

From Point Loads to Uniformly Distributed Loads

An acting force causes a change of direction in the structure. Therefore in the example below a node with the acting force F_1 and the two rope segments 1 and 2 is created.



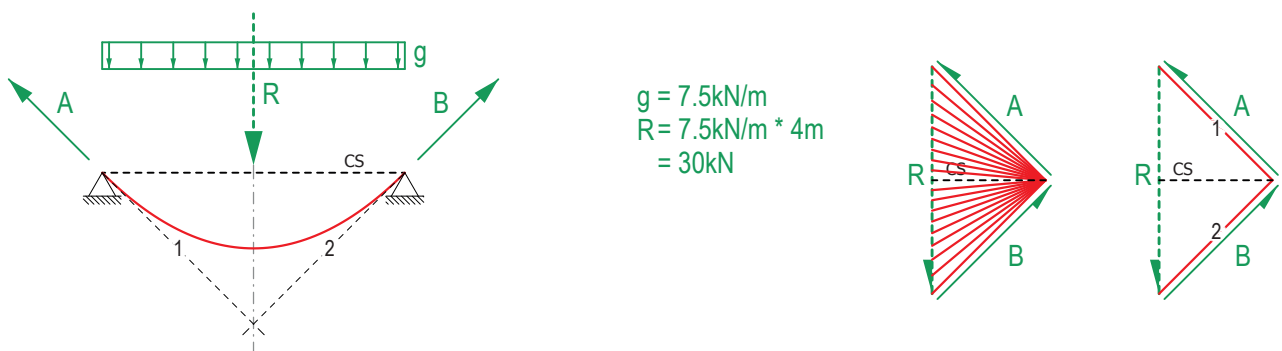
Three acting forces form a cable with four segments. There is always a change of direction where each of the forces act on the structure.



If infinitely many point loads act on the system, this is called *uniformly distributed load* or *line load*. The applied line load means a continuous application of force over a certain length and thus causes a continuous change of direction in the structure. Under a uniformly distributed load, a curve (parabola) is formed.

To find the resultant of a line load, its magnitude [kN/m] is multiplied by its length [m]. Once the resultant has been calculated, it can be drawn in the force diagram as usual. In the form diagram it is always in the centre of the applied line load.

As each change of direction leads to an additional member in the force diagram, there would have to be an infinite number of members in the case of the parabola. To simplify, only the outermost segments, i.e. the tangents to the curve at the supports, are transferred to the force diagram because that is where the inner force is largest.



form diagrams 1:100

force diagrams $1\text{cm} \triangleq 10\text{kN}$