

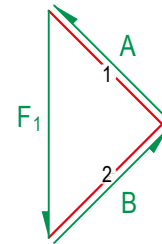
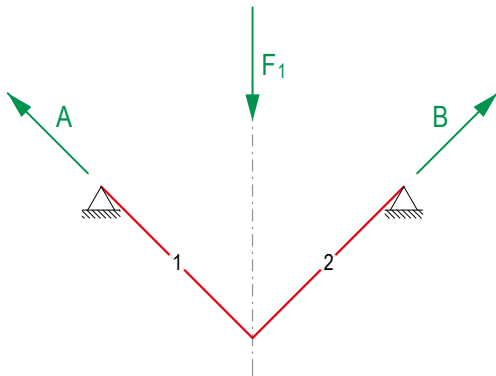
# 2.3

## Comparison: Analysis – Form-Finding

### Given form (Analysis)

If the form of the structure is given, the forces follow the form.

After all acting forces have been drawn as load line in the force diagram, the transfer of the individual elements of the nodes begins. Only nodes with two or less unknown elements can be solved. Starting with the first known force, the elements of the node are transferred one after the other (clockwise) into the force diagram. The force diagram is completed node by node until all elements of the structure and the reaction forces are drawn at least once.

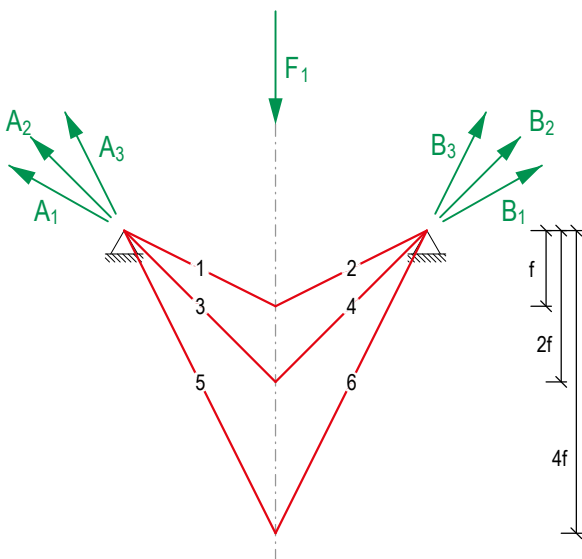


### Form-finding

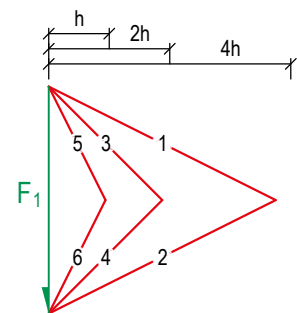
Often the form of the structure has to be designed. In this case the form follows the force.

First the load line is drawn. In the example below, the applied force is equal to the resultant force. The depth of the structure, the so-called rise, can now be freely selected on its line of action. The example shows three of an infinite number of possible cable structures with varying rise  $f$ .

The static depth of the structure is in relation to the magnitude of the horizontal component of the internal forces. The steeper a structure, the smaller the internal forces. If the rise is doubled, the horizontal component of the internal forces is halved, and with it the horizontal thrust of the reaction forces.



$$f = \frac{1}{h}$$



form diagrams 1:100

force diagrams 1cm  $\hat{=}$  10kN