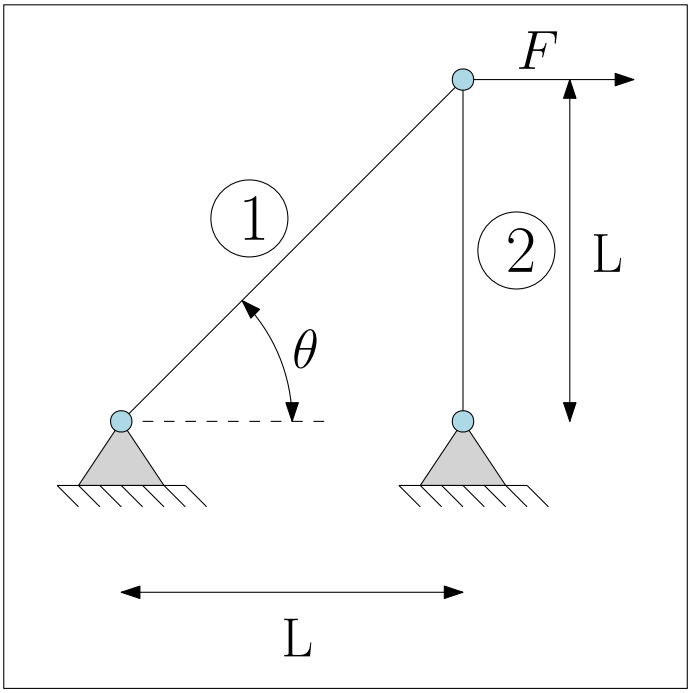
Analysis of planar truss structure

We want to compute the displacement at nodes of the following truss structure



The numerical values for this example are the following:

- $L = 1$ [m];
- Cross section for beam 1: $A_1 = \sqrt{2}A$ where $A = 4 \cdot 10^{-4}$ [m^2];
- Cross section for beam 2: $A_2 = A$;
- Young Modulus (for both beams) $E = 210$ [GPa];
- From the geometry $\theta = \pi/4$;
- Applied force $F = 50$ kN.