Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Lecture "Methods of Finite Elements II"
Prof. Dr. M. H. Faber

Name :.....

Stud. Nr.:.....

Date :.....

Assignment 1

1. Equilibrium conditions of truss system

Idealize the simple truss system shown in Figure 1 as an assemblage of two bar elements. Assume that the force in one bar element is given by ${}^{t}F_{bar} = k\,{}^{t}\delta$ (in the elastic region of the material), where ${}^{t}\delta$ is the elongation of the bar at time t.

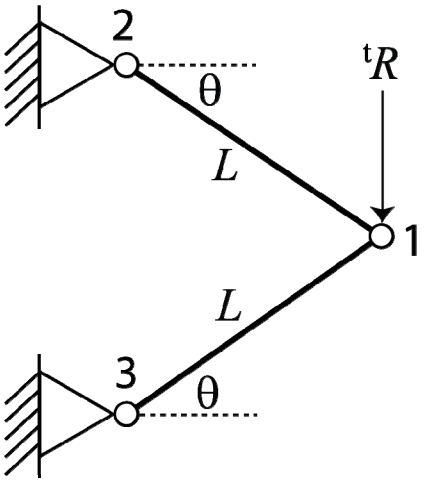

Figure 1. Truss system subjected to time-variant vertical load

(1.1) Establish the equilibrium relation (6.5) for this system, assuming that the deformation is small and the material keeps in its elastic region.

(1.2) Establish the force-displacement relationship for the two bars respectively.

(1.3) Investigate the application of the assumption that the deformation is small.