1. Assemble the stiffness matrix and force vector for the following structure. The truss BC has a constant sectional area A and is heated through temperature ΔT. The springs (spring constant k, and factors thereof) are not heated. The material properties (elastic modulus E and the thermal expansion coefficient α) for the truss are given. There is an external force at x=L as shown below. The system is constrained by a rigid wall on both ends.
   (a) Find the displacement at x=L.
   (b) Find the stress in the truss.
   (c) Find the reaction forces on the walls