

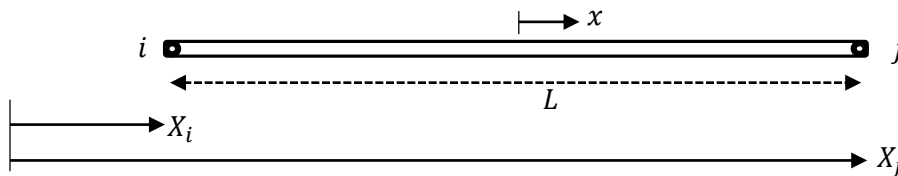
**HOMEWORK #2**

**(DUE DATE: 23 March 2015, HW will be collected at the beginning of the class)**

(Homework of more than one page should be stapled.)

(Homework should be done neatly.)

**Question 1.** Develop the shape functions for a linear element using the local coordinate  $x$  located at the **mid-point** of the element ( $S_i(x) = ?$ ,  $S_j(x) = ?$ ).



**Question 2.** Evaluate the integral  $\int_1^5 (x^3 + 6x^2 + 3x - 2) dx$  using

**(a)** Gauss-Legendre two-point sampling

**(b)** Gauss-Legendre three-point sampling

**Question 3.** Solve Problem 16 (Chapter 4 - "Finite Element Analysis, Theory and Application with ANSYS", Prentice-Hall, 1999 [TA347.F5M62 1999]). Report your results in metric units.