

HIGHER-ORDER ELEMENTS :

- POLYNOMIALS OF 2ND ORDER (OR HIGHER) USED TO DESCRIBE ASSUMED DISP. FIELD
- USUALLY 2ND ORDER IS SUFFICIENT.
- MOSTLY EMPLOYED IN HIGHLY NON-LINEAR OR CRITICAL ANALYSIS PROBLEM.

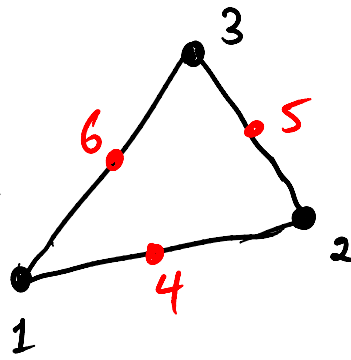
EXPECTED BEHAVIOR IS ONE OF RAPID CONVERGENCE (ESPECIALLY FOR LINEAR PROBLEMS).

6-NODE TRIANGLE (LST)
(12 D.O.F.'S)

$$u(x,y) = a_1 + a_2x + a_3y + a_4x^2 + a_5y^2 + a_6xy$$

$$\epsilon_x = \frac{\partial u}{\partial x} = a_2 + 2a_4x + a_6y$$

STRAIN IS $f(x,y)$. OVERCOMES SPURIOUS SHEAR EFFECT!

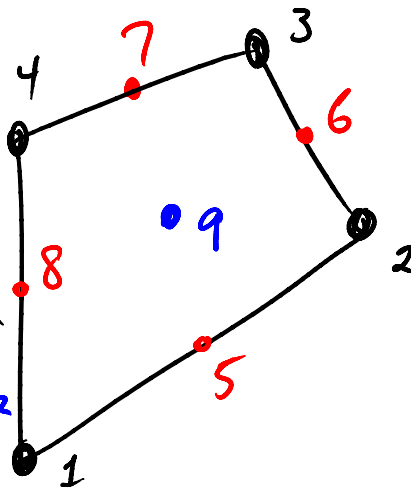


QUADRATIC QUADRILATERAL ELEMENT

$$u(x,y) = a_1 + a_2x + a_3y + a_4x^2 + a_5y^2 + a_6xy + a_7xy^2 + a_8y^2$$

SIMILAR TERMS FOR $v(x,y)$: $+a_9xy^2$

$$\epsilon_x = \frac{\partial u}{\partial x} = a_2 + 2a_4x + a_6y + 2a_7xy + a_8y^2$$



• - SERENDIPITY ELEMENT

• - LAGRANGE ELEMENT

