Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Student number\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3

2

*x,X*

*L*

*L*

1

*y,Y*

**Assignment 2**

Consider the linear triangle element shown. Nodes 1 and 3 are fixed and the non-zero vertical displacement of node 2 is denoted by . Determine the virtual work expression of internal forces using the virtual work density of the thin-slab model.

**Solution template**

Virtual work density of internal forces of the thin-slab model is given by

 where .

Shape functions in terms of ,  and element size 

,  , .

Displacement components

, .

Derivatives of *u* and *v* with respect to *x* and *y*

, , , .

Virtual work density simplifies to

 

.

Virtual work expression is obtained as integral over the element (notice that integrand is constant)

. 🡸