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

**Assignment 1**

Determine the element contributions of bars 2 and 3 of the structure shown using the bar element contribution for the structural coordinate system. Cross-sectional area of all the bars is and Young’s modulus *E.*

2*L*

2*L*

1

5

4

*F*

2

1

3

*X*

*Y*

4

2

5

3

*y*

*x*

*x*

*x*

*x*

*y*

*y*

*y*

**Solution template**

In the structural coordinate system, the element contribution of a bar is given by

, in which .

Above,  consists of components of the unit vector  of the material coordinate system expressed in the structural coordinate system, *h* is the length of the bar element, and components ,  are the differences of the structural coordinates of the element end points.

The quantities in the element contribution of bar 2 are given by

, , and , therefore

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The quantities in the element contribution of bar 3 are given by

, , and , therefore

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