

CIVL.666, MANE.666
FUNDAMENTALS OF FINITE ELEMENTS
HOMEWORK 5
Due: October 8, 2019

BE SURE TO GET THIS ONE IN ON TIME SINCE IT WILL BE GRADED TO BE RETURNED SO YOU HAVE IT FOR PREPARING FOR THE TEST.

1. Exercise 5 on page 105 of the text book
2. Exercise 6 on page 105 of the text book (note – only go as far as doing it for the standard index notation, do not worry about the conversion to the matrix form)
3. (to be graded – do this after we finish the handout being covered in class) The mesh and boundary conditions given below are for a 2-D elastostatics problem. Following the method given in the class handout, determine the ID matrix, IEN vectors and LM matrix. Also indicate the locations in the stiffness matrix, or force vector the “contributions” for the terms in the element stiffness matrix for element 7 will go.

Essential BC information (be sure to account for it):

The vertical edge (nodes 1,4,7,8 are on it) can not move in the in either direction

The horizontal edge (nodes 15, 3,13 on it) has a prescribed vertical displacement of 0.05 units.

Note – Nodes are marked with a black dot (there are corner nodes and three edge nodes).
Element numbers have the circles around them.

