!PLANE182: 4-nodes, 2D element, 2DOF/NODE (UX,UY)

!Steel, E=210E3, Poisson’s ratio 0.3

!Units are mm and N (therefore, E and stress are N/mm^2 = MPa)

!ME304 Project: Cantilever bracket

!This model is a rectangular bracket 300mmX200mm

FINISH !Finishes any previous activity

/CLEAR !Clears any previous activity

/BATCH !Works in “batch” mode

/PREP7

!Define geometry and load parameters.

LENGTH=300

HEIGHT=200

THICKNESS=10

LOADLENGTH=50 !apply downward force spread over this length

PRESSAREA= !The area that the applied load (“pressure” acts upon)

APPLFORCE=

PRSR=APPLFORCE/PRESSAREA

ET,1,PLANE182

MP,EX,1,210E3

MP,PRXY,1,0.3

KEYOPT,1,3,3 !Use plane stress (through the thickness)

R,1,THICKNESS !Use “THICKNESS” as the through thickness dimension

!Define locations of key points.

K,1,0,0,0

K,2,0,HEIGHT,0

K,3,LENGTH-LOADLENGTH,HEIGHT,0

K,4,LENGTH,HEIGHT,0

K,5,LENGTH,0,0

L,1,2 !Create a line connecting Key Points 1 and 2.

L,2,3 !Line connect KP 2 and 3

L,3,4 !Pressure is applied to line 3. It must be horizontal and at the tip.

L,4,5

L,5,1

/PNUM,AREA,1

AL,ALL

SMRTSIZE,3

AMESH,ALL

FINISH

/SOLU

!Constrain in x directions the nodes at left edge:

NSEL,S,LOC,X,0 !select all nodes along X=0

D,ALL,ALL,0 !Prevents ALL displacement of selected nodes

!Apply distributed force along line (SFL)

SFL,3,PRES,PRSR !Line 3, apply a PRES(pressure)of magnitude PRSR

ALLSEL !Since we have used NSEL to select specific nodes, we now need ALLSEL to select all of the nodes

SOLVE

FINISH

/POST1

/ESHAPE,1 !Display element shapes using section data

/RGB,INDEX, 0, 0, 0,15 !set text color to black

/COLOR,WBAK,14 !Set background color to light grey

/DSCALE,ALL,1 !Plot using true scale

!/VIEW,1,1,1,1

FINISH !Finish and exit the post-processor

SAVE !Save the data base