!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)

FINISH !Finishes any previous activity

/CLEAR !Clears any previous activity

/BATCH !Works in “batch” mode

/PREP7

!Define geometry and load parameters.  
!Flat 100X30X10 plate with 20mm dia hole in middle

!2-axis of symmetry – model 1/4 of whole

LENGTH=xxx

HEIGHT=xxx

THICKNESS=xxx

RADIUS=xxx

PRESSAREA=xxx

APPLFORCE=xxx

PRSR=xxx

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,HEIGHT,0

K,4,LENGTH,RADIUS,0

K,5,LENGTH-RADIUS,0,0

K,6,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

L,5,1

LARC,4,5,6,RADIUS !Create an arc between KP 4 and 5, with the center of curvature on the side of KP 6

/PNUM,AREA,1

AL,ALL

SMRTSIZE,3

AMESH,ALL

FINISH

/SOLU

!Apply constraints

NSEL,xxx

D,xxx

!Apply symmetric BC’s

NSEL,xxx

D,xxx

!Apply force:  
NSEL,xxx

SF,xxx

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