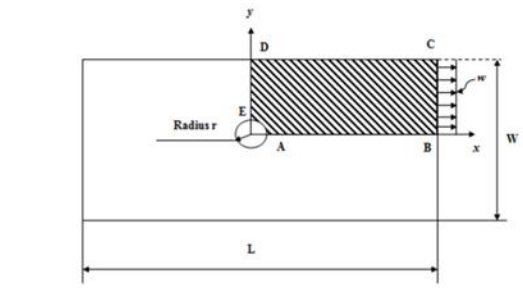
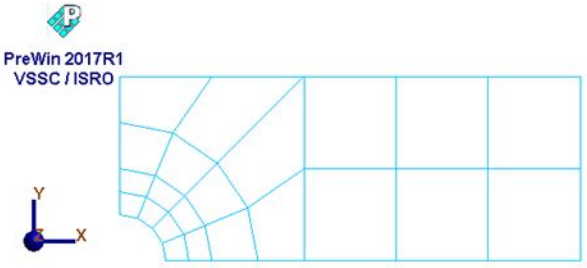
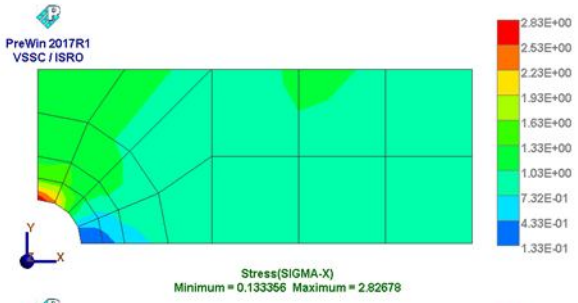
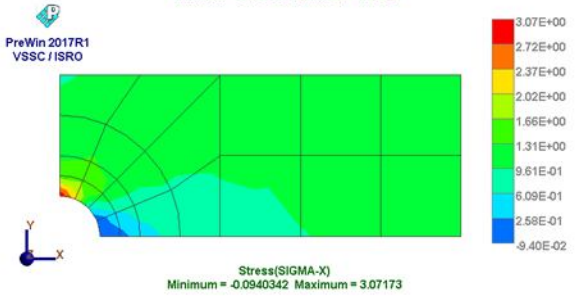
# Static analysis of hole in a plate under tension






**Load** : Uniformly distributed load of 1 *N/mm* in the *x* direction along BC

**Boundary condition** : Along AB, $U_y = 0$; Along DE, $U_x = 0$

**Material property** : E = 200 *GPa*, ν = 0.3

**Geometric property** : Thickness =1.0 *mm*, length = 200 *mm*, width =80 *mm*, hole radius = 10 *mm*

**Element type** :
Case 1 4-node plane stress element
Case 2 8-node plane stress element

**Finite element statistics**

| | Number of elements | Number of nodes | Degrees of freedom |
|---|---|---|---|
| **Case 1** : | 22 | 34 | 55 |
| **Case 2** : | 22 | 89 | 154 |

| Axial stress, $\sigma_x$(*MPa*) at point E | | | |
|---|---|---|---|
| **Cases** | **NAFEMS** | **FEAST**$^{SMT}$ | **NASTRAN**® |
| 1 | 3.00 | 2.83 | 2.76 |
| 2 | | 3.07 | 3.04 |