Description :

A triangular plate with point load (P) on one corner is tested and its opposite edge is build-in.

Reference :

C.O.Harris , Introduction to Stress Analysis, The Macmillan Co., pg:114, Pr:61.
Solution Retrieved from Ansys verification problem (VM34).

Material and Geometric data :

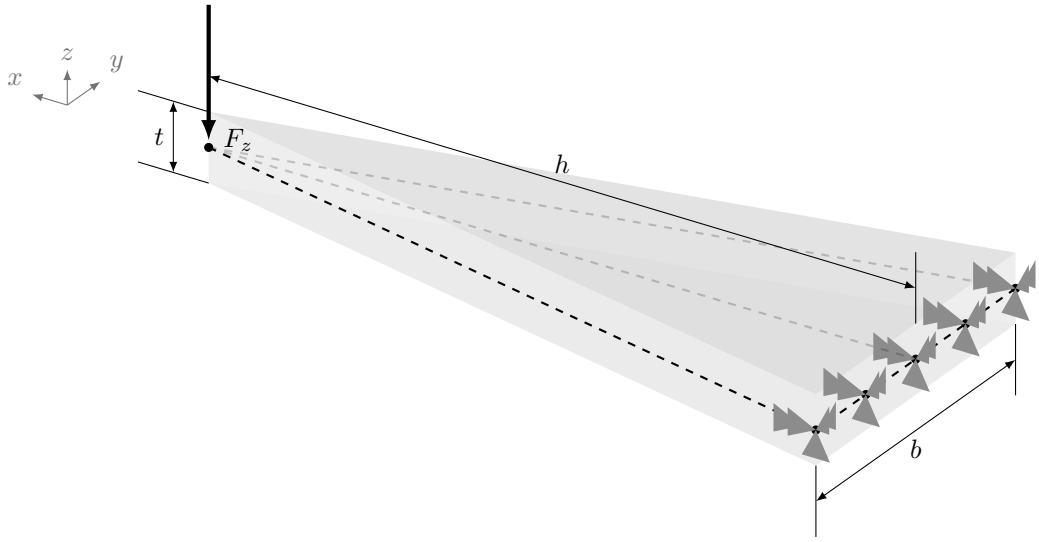

Figure 1: VM34

Table 1: Input Data

Material Property		Geometric Data		Loading Data	
Young's Modulus (E)	3E7 psi	Height (h)	20 in	Point Load (F_z)	10 lbs
Poission's Ratio (ν)	0.3	Breath (b)	3 in		
		Thickness(t)	0.5 in		

Mesh and boundary condition :

Table 2: FEM and Boundary condition data

Direchlet Boundary				Neumann Boundary			
Geo - Entity	w	θ_x	θ_y	Geo - Entity	F_z	M_x	M_y
line {3}	Fixed	Fixed	Fixed	Point {2}	-10 lbs		

Analytically solution :

The target analytically solution is given as -0.042677 in at the corner where the loading is applied.

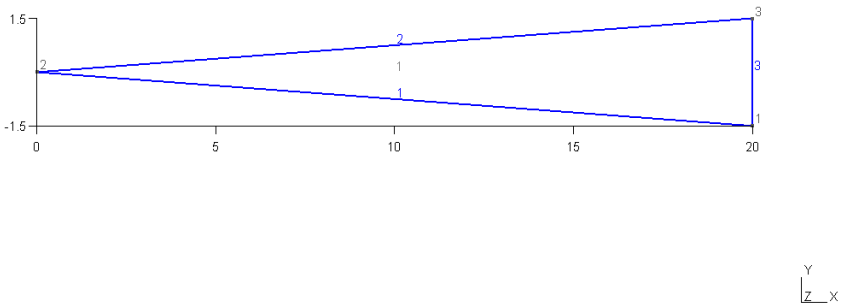

Figure 2: Geomentry of the problem

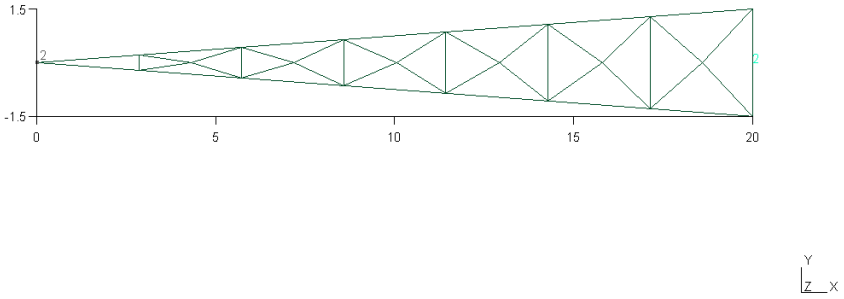

Figure 3: Discritization

Result and error analysis :

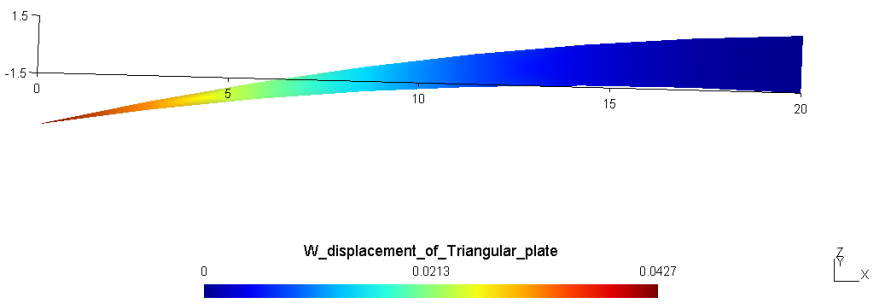

Figure 4: FEM solution plot

The maximum displacement of the domain is our solution . w displacement at point 2 is $-0.0426677in.$

So the Error percentage is 0.00234%.