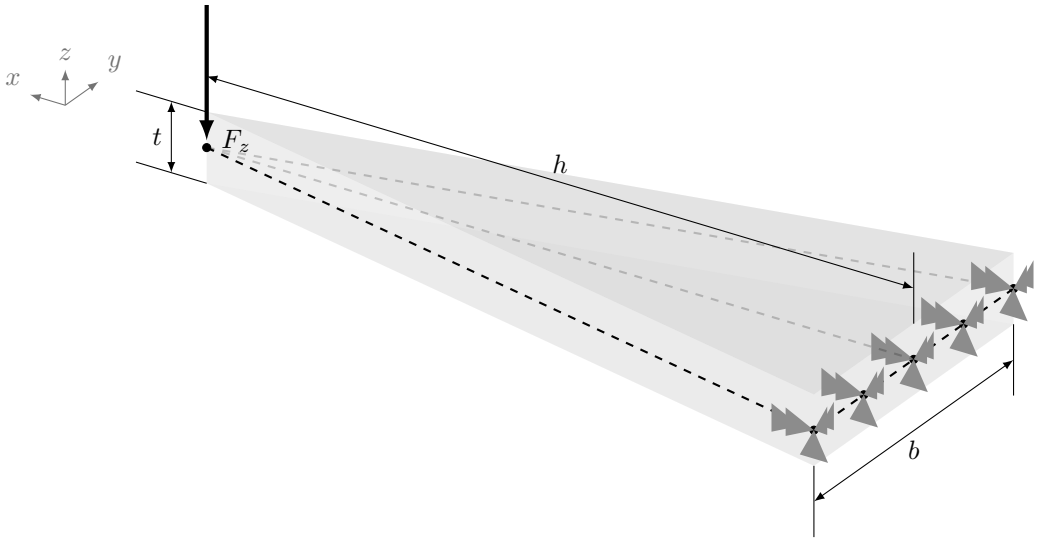

Figure 1: VM34

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 :

Table 1: Input Data

Material Property		Geometric Data		Loading Data	
Young's Modulus (E)	2E11 Mpa	Length (l)	2 m	Point Load (P)	20 N
Poission's Ratio (ν)	0.3	Breath (b)	2 m	Distributed Load (P)	20 N/m^2
Density (ρ)	8000 Kg/m^3	Thickness(t)	0.01 m		

Mesh and boundary condition :

Table 2: FEM and Boundary condition data

Mesh Data		Direchlet Boundary				Neumann Boundary			
element size ≈	0.02 m	Geo - Entity	w	θ_x	θ_y	Geo - Entity	F_z	M_x	M_y
Mesh file Name	some.msh	line {1,2,3,4}	Fixed	Free	Free	Point {4}	10 N		

Analytically solution :

The target analytically solution given is 0.042677 In at load applied location.

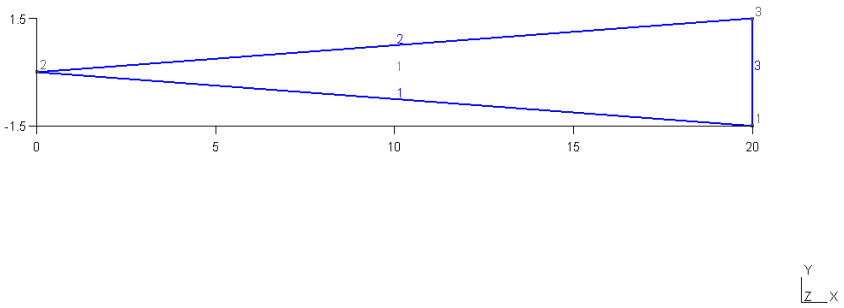

Figure 2: Geomentry of the problem

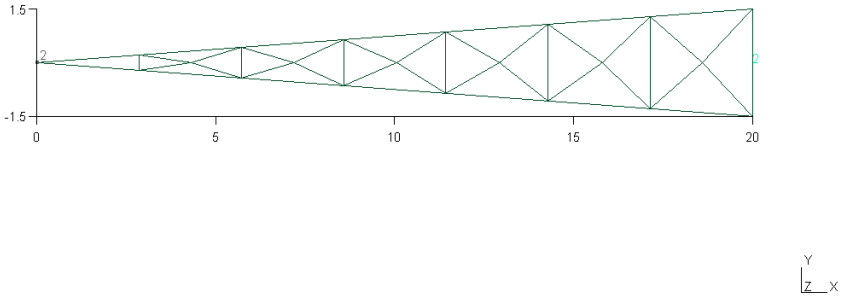

Figure 3: Discritization

Result and error analysis :

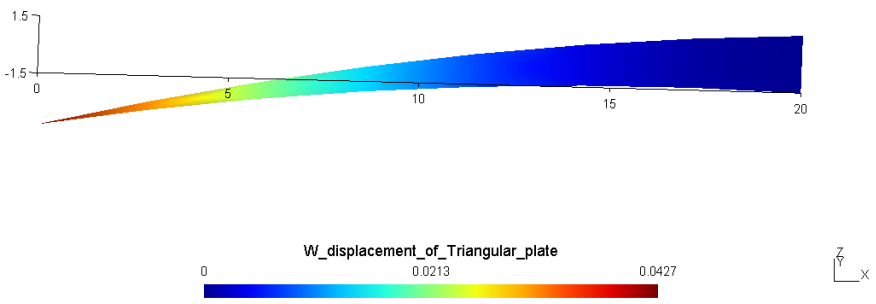

Figure 4: FEM solution plot

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

$$error\% = \mid \frac{w_{analytical} - w_{FEM}}{w_{analytical}} \mid \times 100 \tag{1}$$

So the Error percentage is 0.00234%.