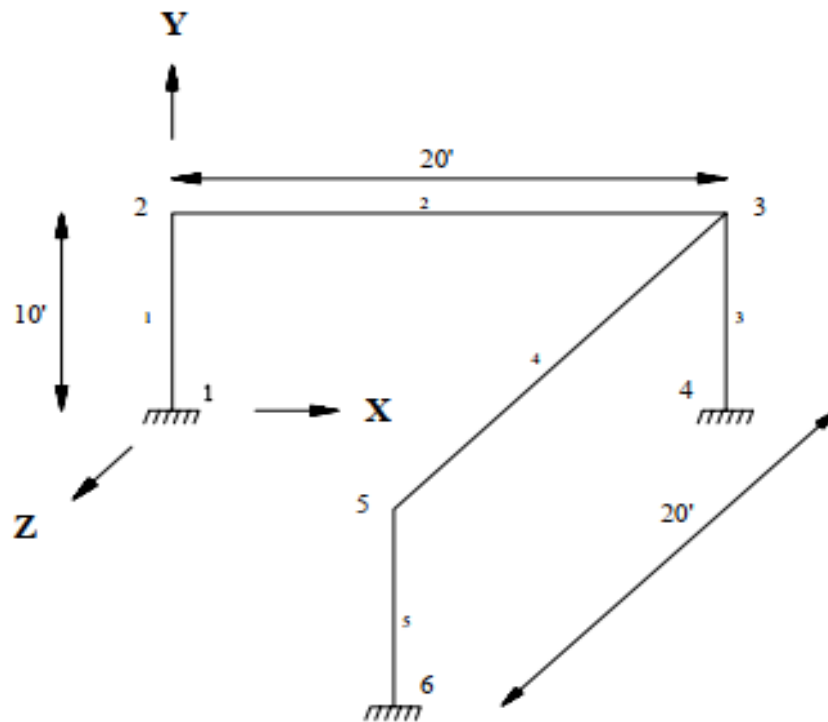




## Example Problem No. 5

This example demonstrates the application of support displacement load (commonly known as sinking support) on a space frame structure.





Actual input is shown in bold lettering followed by explanation.

### **STAAD SPACE TEST FOR SUPPORT DISPLACEMENT**

Every input has to start with the word **STAAD**. The word **SPACE** signifies that the structure is a space frame structure (3-D) and the geometry is defined through X, Y and Z coordinates.

#### **UNITS KIP FEET**

Specifies the unit to be used for data to follow.

#### **JOINT COORDINATES**

**1 0.0 0.0 0.0 ; 2 0.0 10.0 0.0  
3 20.0 10.0 0.0 ; 4 20.0 0.0 0.0  
5 20. 10. 20. ; 6 20. 0. 20.**

Joint number followed by X, Y and Z coordinates are provided above. Semicolon signs (;) are used as line separators. That enables us to provide multiple sets of data on one line.

#### **MEMBER INCIDENCE**

**1 1 2 3  
4 3 5 ; 5 5 6**

Defines the members by the joints they are connected to.

#### **UNIT INCH**

#### **MEMB PROP**

**1 TO 5 PRIS AX 10. IZ 300. IY 300. IX 10.**

Member properties have been defined above using the **PRISMATIC** attribute. Values of **AX** (area), **IZ** (moment of inertia about major axis), **IY** (moment of inertia about minor axis) and **IX** (torsional constant) are provided in **INCH** unit.

#### **CONSTANT**

**E 29000. ALL**

**POISSON STEEL ALL**

Material constants like E (modulus of elasticity) and Poisson's ratio are specified following the command **CONSTANTS**.



**SUPPORT  
1 4 6 FIXED**

Joints 1, 4 and 6 are fixed supports.

**LOADING 1 SINKING SUPPORT**

Load case 1 is initiated along with an accompanying title.

**SUPPORT DISPLACEMENT LOAD  
4 FY -0.50**

Load 1 is a support displacement load which is also commonly known as a sinking support. FY signifies that the support settlement is in the global Y direction and the value of this settlement is 0.5 inch downward.

**PERFORM ANALYSIS**

This command instructs the program to proceed with the analysis.

**PRINT ANALYSIS RESULTS**

The above PRINT command instructs the program to print joint displacements, support reactions and member forces.

**FINISH**

This command terminates the STAAD run.



*Computer engineering*

*Lecture Nine*



*Al Mustaqbal University*

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