

King Fahd University of Petroleum & Minerals

Department of Civil and Environmental Engineering

CE 201 – Statics

Semester: 132
Examination: Second
Date (Day): April 18, 2014 (Friday)
Time: 02:00 – 05:00 p.m.

Section	1	2	3	4	6	7	8
Instructor	Al-Malack	Al-Malack	Chowdhury	Al-Attas	Arifuzzaman	Hussein	Hajyaseen
Time	07:00	08:00	09:00	10:00	11:00	09:00	10:00
Tick							

Student's Name :
Student's ID :

Problem	Assigned Grade	Earned Grade
1-A	15 (Points)	
1-B	10 (Points)	
2	25 (Points)	
3	25 (Points)	
4	25 (Points)	
Total	100 (Points)	

Good Luck

Problem 1-A (15 Points)

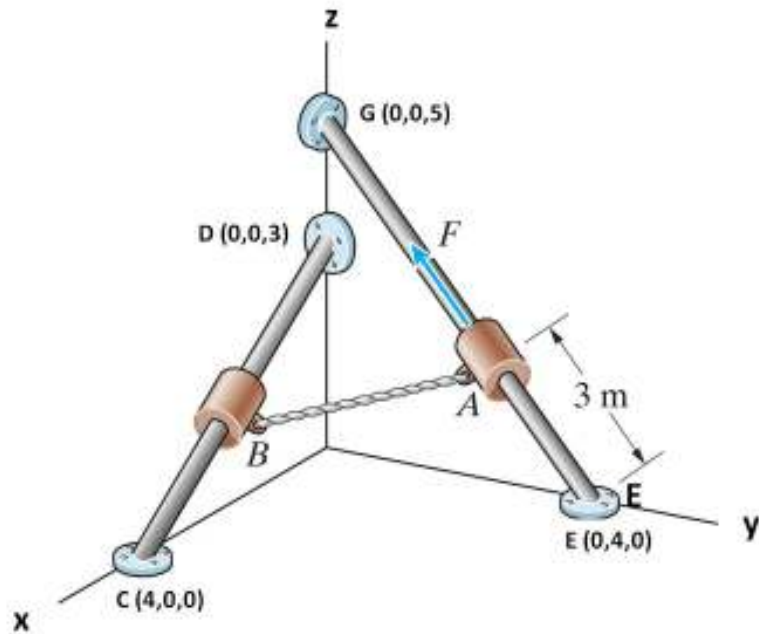
In the figure shown, if $F = 1000$ kN, determine:

1. The moment of force F about the axis CD (Express the moment in Cartesian vector formulation).
2. The perpendicular distance between the force and axis CD .

Notes:

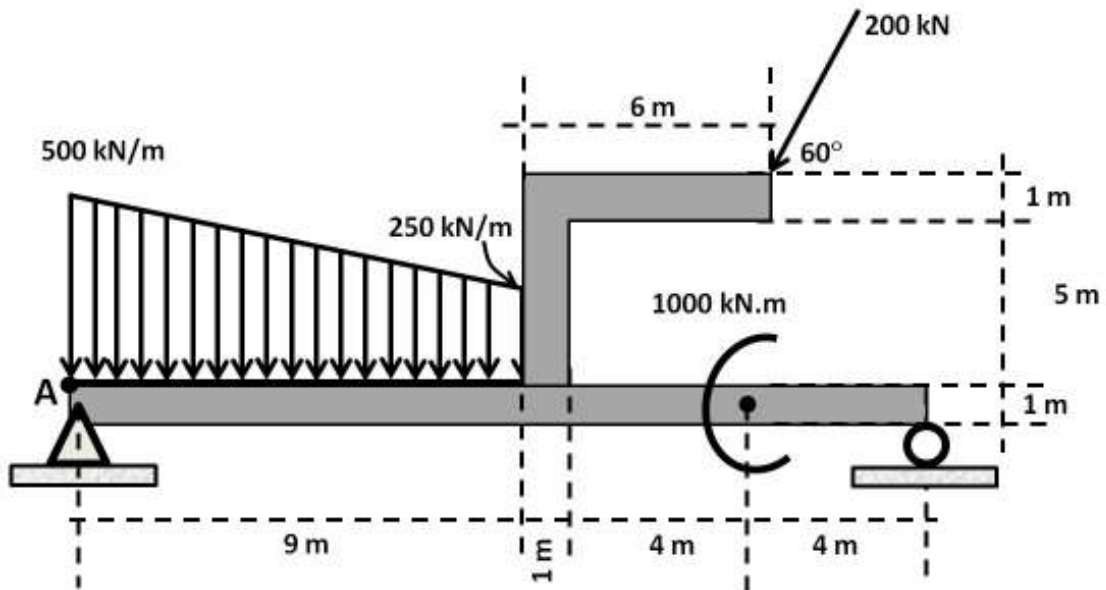
Point B is mid-way between points C and D

Show all solution steps



Problem 1-B (10 Points)

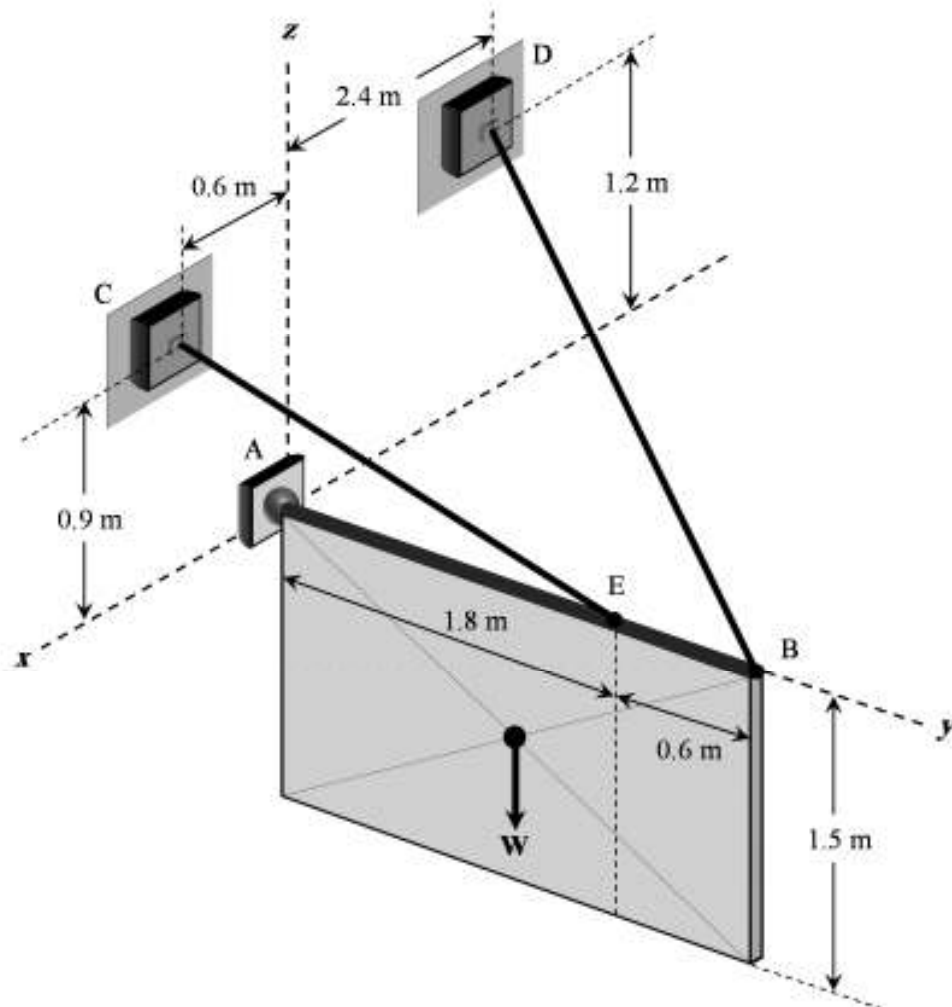
The beam shown below is supported by a pin (at A) and a roller (at the other end). Replace the force and couple system acting on the beam by an equivalent force and couple moment acting at point A. **Show all solution steps.**



Problem 2 (25 Points)

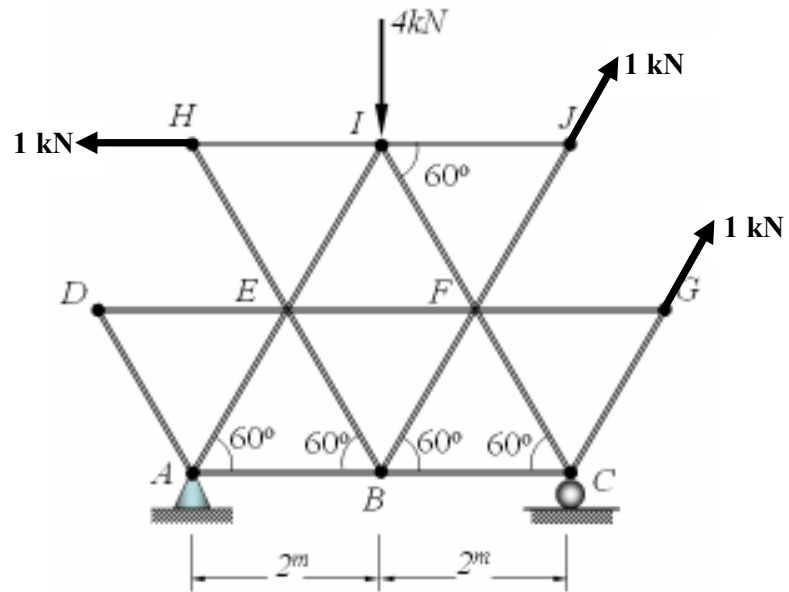
The boom AB is used to support the 540-N sign board as shown in the figure. Determine the tension developed in cables BD and EC as well as the reactions at A (Ball-and-Socket).

NOTE: Draw the FBD of the system.



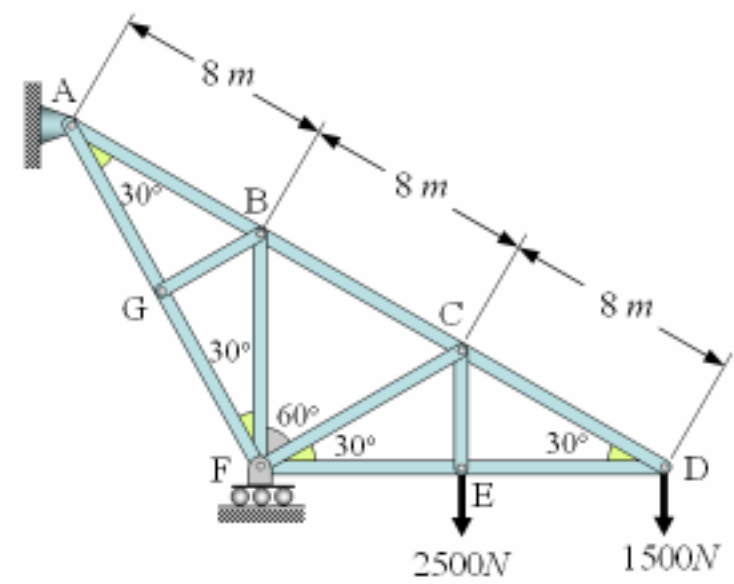
Problem 3 – A (5 Points)

Identify, by inspection, the zero-force members in the truss shown below. **Note:** There is a penalty of 1.5 point for each wrong answer.



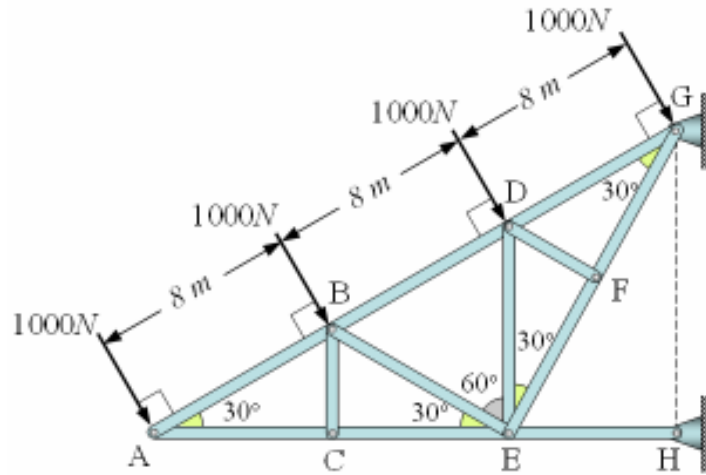
Problem 3 – B (10 Points)

Determine the force in members **DC**, **DE**, **EF** and **EC** of the truss by the **method of joints**. Indicate if the members are in tension or compression.



Problem 3 – C (10 Points)

Determine the force in members **BD**, **BE** and **CE** of the truss shown below using the **method of sections**. Indicate if the members are in tension or compression.



Problem 4 (25 Points)

The frame shown below is composed of 3 members (ABCD, CEF and ED). The frame is supported by a roller (at A) and a pin (at B). If a 100-N weight is hanged at joint F. Determine the horizontal and vertical components of reactions at pins A, B, C, D and E of the frame. **Show all solution steps.**

