King Fahd University of Petroleum & Minerals

Department of Civil and Environmental Engineering

CE 201 – Statics

Semester: 132
Examination: First Major
Date (Day): February 25, 2014 (Tuesday)
Time: 07:00 – 09:00 p.m.

Section	1	2	3	4	6	7	8
Instructor	Al-Malack	Al-Malack	Schowdhury	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 :

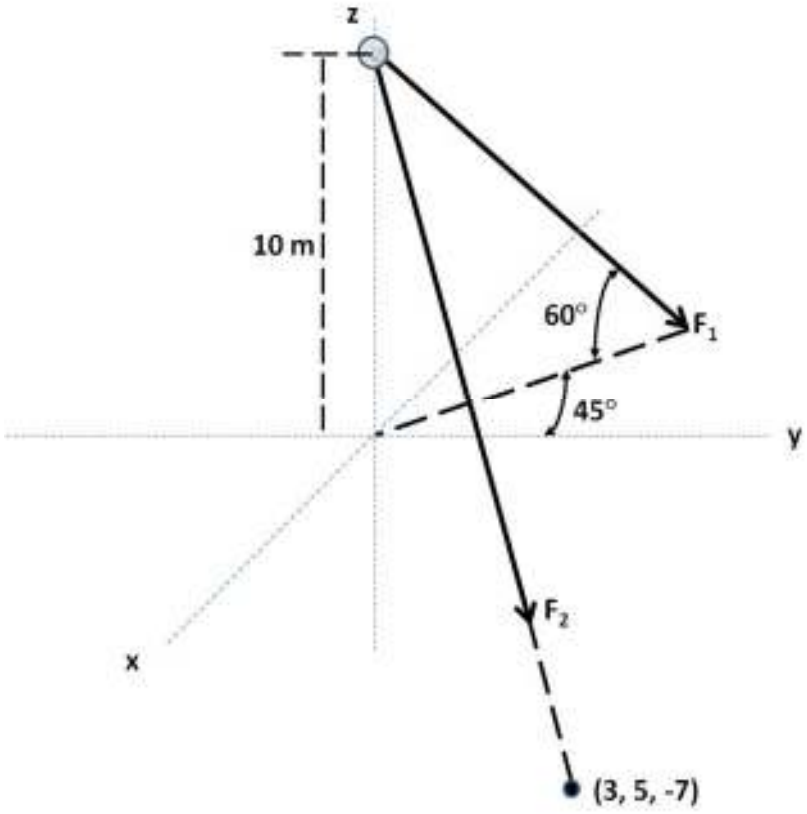
Problem	Assigned Grade	Earned Grade
1	25 (Points)	
2	25 (Points)	
3	25 (Points)	
4	25 (Points)	
Total	100 (Points)	

Good Luck

Problem 1 (25 Points)

Given the below information, find the magnitude of F_1 if the resultant force (of F_1 and F_2) lies in the y-z plane. Find the magnitude and direction of the resultant force.

$F_2 = 500$ N



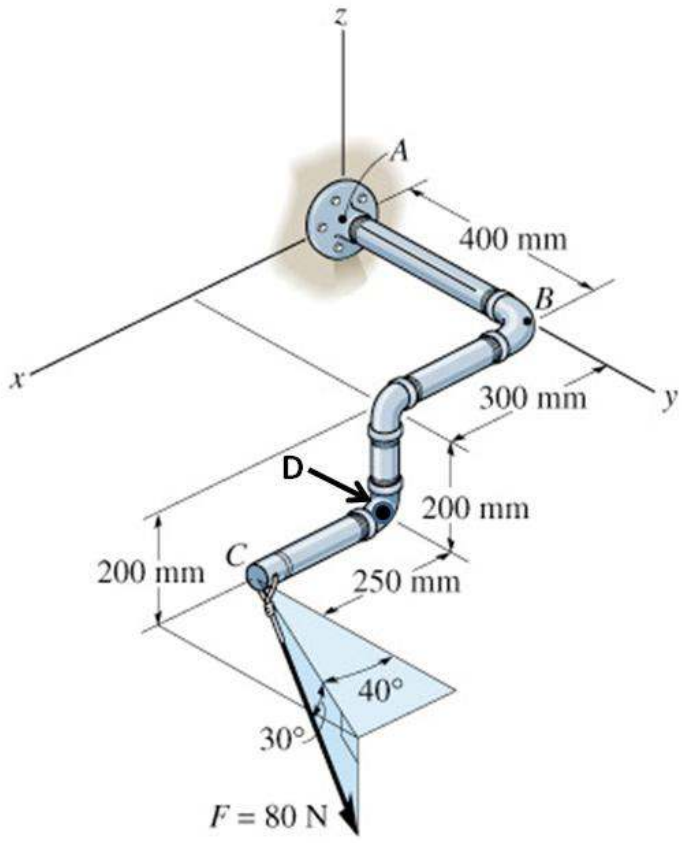
Problem 2 (25 Points)

For the force system shown below, determine the following using the **dot product**:

(10 Points) A) The angle between force F and line AC

(15 Points) B) The projection of force F along line AD (D is shown by the arrow in the figure below)

Note: Show All Solution Steps

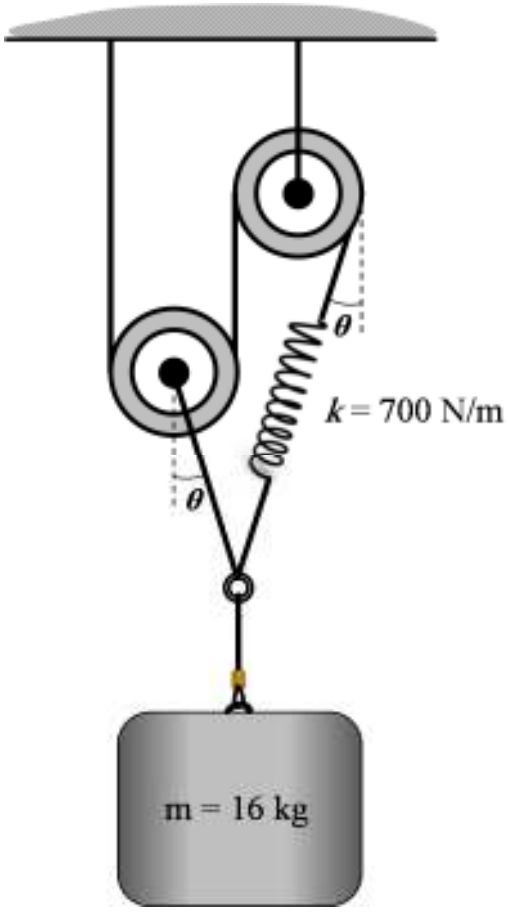


Problem 3 (25 Points)

The pulley system shown in the figure is in equilibrium, the spring constant k = 700 N/m and the suspended mass m = 16 kg. Find the tension in all cables and how much will the spring stretch knowing that $\theta = 30°$?

NOTE:

- The solution must include FBDs
- Neglect the weight of pulley and friction.



Problem 4 (25 Points)

The 100-N cylinder is supported at ring A by two cables (AB and AC) and spring AD. The unstretched length of the spring is 4.75. Determine the tension forces in cables AB and AC and the spring stiffness (k).

Note:
Point A is on the z-axis
Point D is on the y-axis
Points B and C are in the x-y plane