

King Fahd University of Petroleum & Minerals

Department of Civil and Environmental Engineering

CE 201 – Statics

Semester: 131
Examination: First Major
Date (Day): October 1, 2013 (Tuesday)
Time: 07:00 – 09:00 p.m.

Section	1	2	3	4	5	6	7	9	10
Instructor	Al-Malack	Al-Malack	Schowdhury	Vohra	Hussain	Al-Attas	Al-Amoudi	Al-Osta	Hajyaseen
Time	07:00	08:00	08:00	09:00	10:00	11:00	11:00	10:00	09:00
Tick									

Student's Name :
Student's ID :

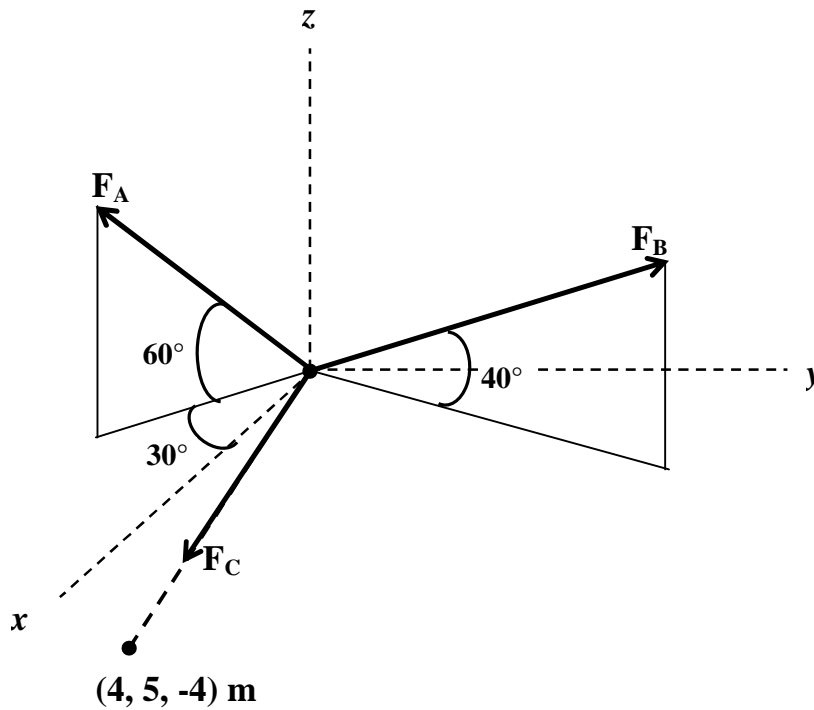
Problem	Assigned Grade	Earned Grade
1	25 (Points)	
2	25 (Points)	
3	25 (Points)	
4	25 (Points)	
Total	100 (Points)	

Good Luck

Problem 1 (25 Points)

Given the below information, determine the magnitude and direction of the resultant force for the force system shown in the figure. **Express the resultant force in Cartesian vector form.**

- $F_A = 120 \text{ N}$
- $F_B = 100 \text{ N}$
- The ratio of F_{By} to $F_{Bx} = 2.0$ (i.e. $F_{By} / F_{Bx} = 2.0$)
- $F_C = 60 \text{ N}$

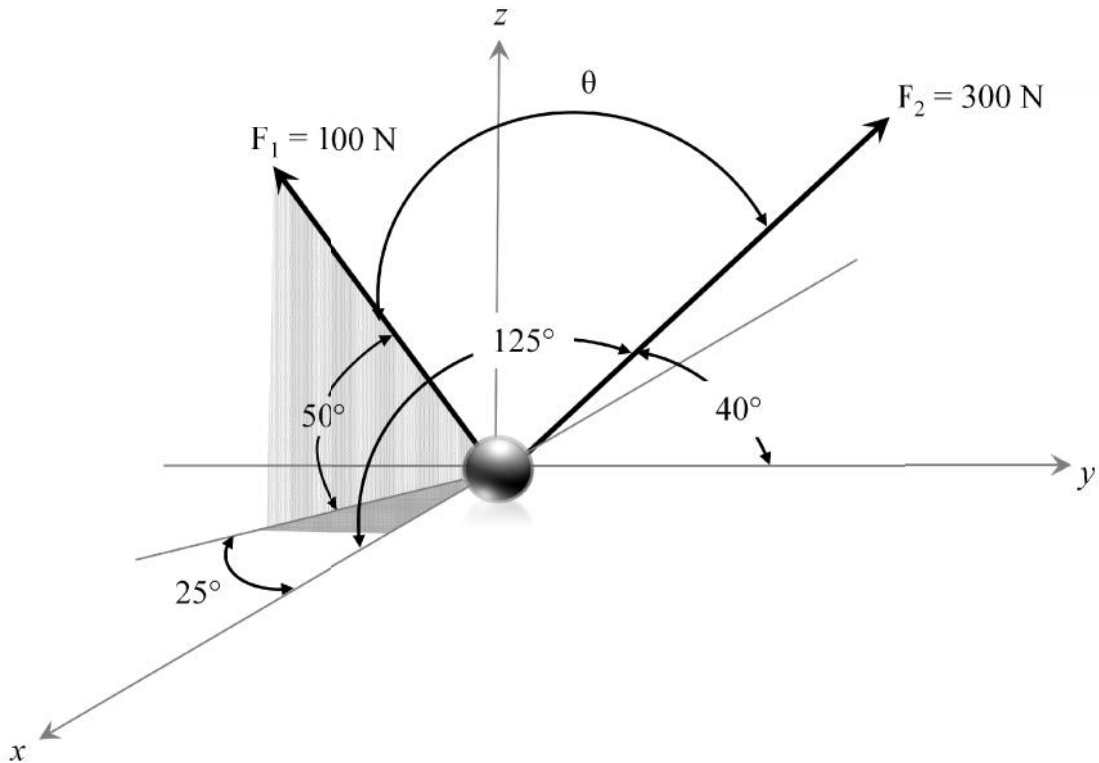


Problem 2 (25 Points)

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

(10 Points) A) The angle between force F_1 and force F_2

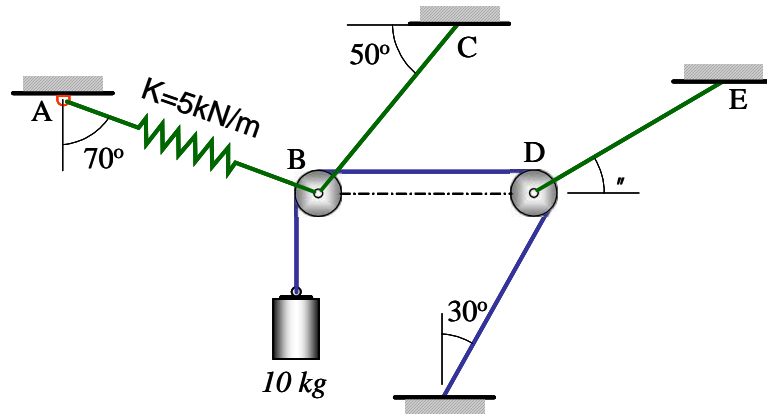
(15 Points) B) The projection of force F_1 along the force F_2 (**Express in Cartesian Vector Form**)



Problem 3 (25 Points)

The 10-kg mass is supported by the cable system shown below. Determine the tension in cables AB, BC, DE, the stretch of spring AB (s) and the angle θ .

Note that both pulleys are frictionless and have negligible diameters.



Problem 4 (25 Points)

The 100-kg cylinder shown in the figure below is supported by four cables, AB, AC, AD, and AE. If the spring in cable AB has a stiffness of $k = 500 \text{ N/m}$ and is stretched by 0.5 m, determine the tension in cables AB, AC, AD and AE.

