MIDDLE EAST TECHNICAL UNIVERSITY

MECHANICAL ENGINEERING DEPARTMENT

ME 205 STATICS – FALL 2018

SECTION 1

HOMEWORK #1

Submit the solution of the first problem to D-106. The rest is for self-study.

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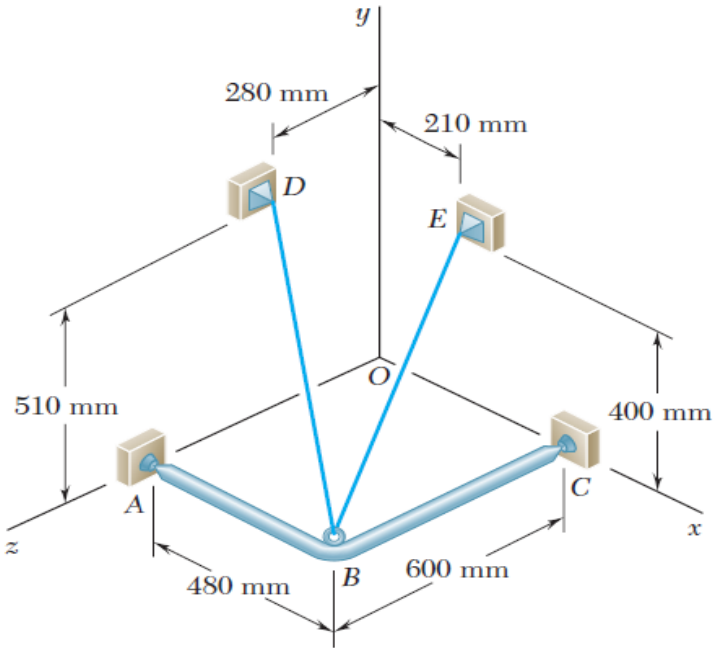
Assigned Date: 19.10.2018
Due Date: 26.10.2018
Due Time: 16.00
Grading Due Date: 09.11.2018

Please include your name, student ID, due date, a proper headline, page number with total page number, and units in your homework. Neatness will be graded.

1. The cable *DBE* that passes through a frictionless ring at *B* supports the frame *ABC.* If the tension in the cable is 300 N, determine
   a. The unit vectors along the lines *BD* and *BE,*
   b. The resultant force at *B* due to the tension forces,
   c. The component of the tension forces along the line *OB*,
   d. The angle between the tension forces.



2. The 40-kg mass is held by two cables and two identical springs at the position given below. If the initial length of the springs is 1.5 m and the spring constant is 400 N/m, determine

- **a.** The unit vectors along the lines *OA, OB,* and *OC,*
- **b.** The resultant force at *O* due to the spring forces,
- **c.** The final length of each spring,
- **d.** The components of the spring forces along the line *OC.*