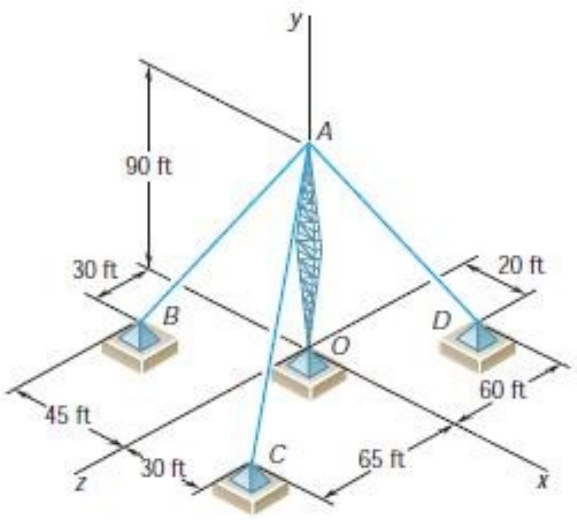
PROBLEM SOLVING FOR ENGINEERING TRANSFER (ENS 1300)
Lab 8

Problem 1

The schematic to the right shows a transmission tower. The tower is supported by the three cables, AD, AC, and AB. The tension in cable AD is equal to 12,000N. Complete the following steps in order to determine the magnitude of the moment due to the tension in AD about point O.



(a) Calculate the unit vector, uv, from A to D Multiply the magnitude of the force times the unit vector from A to D to get the force vector, FV.

(b) Calculate M_O, the moment due to the force around point O (r_{OA} X FV where r_{OA} is the position vector from O to A).

(c) Calculate the magnitude of M_O.

Problem 2

(a) Solve for the unknowns A, B, C, D, E and F in the following system of linear equations.

3A + 2B - 4C + 5D + 3E + 2F = 74

4A - 5B + 2C + 3D - 2E + 5F = 53

6A - 3B + 7C - 2D + 3E + 5F = -6

-2A + 4B - 3C + 7D - 4E + 3F = 120

3A + 7B - 4C + 5D + 6E + 2F = 87

-4A + 5B - 3C - 6D + 7E + 2F = -49

(b) Solve for the unknowns u, v, x, y and z in the following system of linear equations.

2x + u +3v=18

-2x +z +2u-2v = -6

-5x+4v=3u

5x+y-5u+v=6

2x+y+4z-4u+2v=14