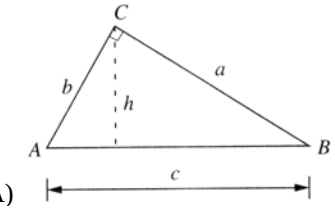
ARCH 331. Assignment #2

Date: 9/3/13, *due 9/12/13* *Pass-fail work*

Problems: supplemental problems (2A, etc.) **and** from Onouye, Chapters 2, 3 & 4
*Notes: Problems marked with a * have been altered with respect to the problem stated in the text. The "Find, Given, Solution" format **is required** unless noted.*

(5%) 2A) In the right triangle *ABC* shown, c = 25 ft and angle A = 48°. Determine a) side a, b) side b, and c) height h. *(math)*

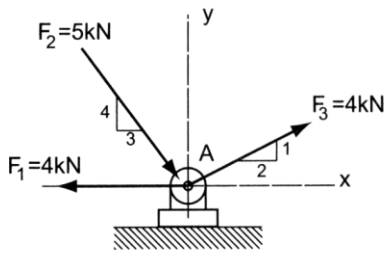
***Partial** answer to check with: h = 12.43 ft*



Problem 2A)

(12%) *2.3.5 Determine the resultant using the sequence F_1 to F_2 to F_3. ~~Scale: 10 mm = 1 kN~~ *(force component method)*

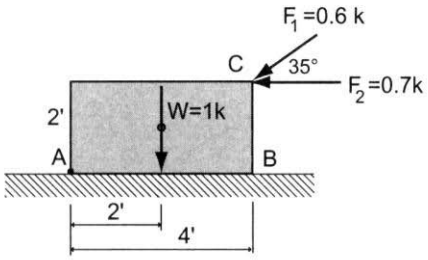
***Partial** answers to check with: R = 3.4 kN, θ = -40.6° (below +x)*



Problem 2.3.5

(13%) **2.4.2** A 1000-lb. crate is subjected to two applied forces at *C*. Determine the moment about points *A* and *B* due to forces F_1, F_2, and the weight *W*. (*moment of a force and of force components)*

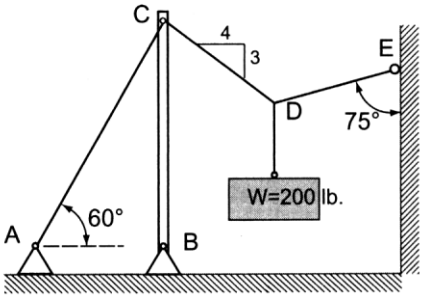
***Partial** answers to check with: M_A = -1.0 k-ft, M_B = +4.4 k-ft.*



Problem 2.4.2

(26%) **3.1.8** A 200-lb. weight is supported by cables *DC*, *AC*, and *DE* and by the vertical pole *BC*. Determine all cable forces and the force in the pole *BC*. (*equilibrium of a particle)*

***Partial** answers to check with: DE = 203 lb, DC = 246 lb, AC = 393 lb, BC = 488 lb (C)*



Problem 3.1.8

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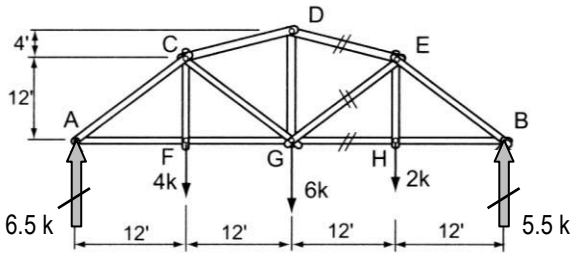
(35%) ***4.1.15** A bowstring or crescent truss is loaded as shown. Determine all member forces ~~in *DE, EG,* and *GH*.~~ using the method of joints, and knowing there is a vertical support force of 6.5 k up at A, and 5.5 k up at B.

(method of joints)

***Partial** answers to check with: AC = -9.2 k, CF = 4 k, CG = 0.4 k, HG = 5.5 k, ED = -7.12 k, EG = 1.77 k, EB = -7.78 k.*



Problem 4.1.15

(9%) 2B) For the truss of problem *4.1.15, use Multiframe software to find all member forces to verify your work from method of joints. <u>You will be assigned a standard wide-flange (W) steel section to use posted in My Grades on eCampus</u>. Model the force at A using a pin support (triangle) and the force at B using a roller support (triangle with wheels) as shown in the figure. Submit the data file (.mfd) on eCampus (under Assignments: Assignment 2) and provide a print of the axial forces diagram (P).

*Note: The "Find, Given, Solution" format is not required, but the data file submitted to e-Learning and the print-out attached to the submission **are**.*