ARCH 614. Assignment #1

Date: 1/21/14, due 1/28/14

Pass-fail work

Problems: all but 1A & 1B from Ambrose & Tripeny, Chapter 1 & 2, pgs 18, 20, 25, and 85.

(2.5%) 1A) Determine the weight in newtons (N) of a car whose mass is 1550 kg. Convert the mass of the car to kN and then determine its weight in pounds and kips. (No figure.) (conversions)

Partial answer to check with: $15,205.5\, N$

(2.5%) 1B) You are given two measurements off a non-dimensional ruler of $A = 8.69$ and $B = 1.427$ marked in $100^{\text{ths}}$ (0.01). Knowing the accuracy of the data you are given, determine the quantities of $A+B$, $A-B$, $A \times B$ and $A/B$ with reasonable precision. (math & precision)

Partial answers to check with: $A+B = 10.1$, $A \times B = 12.4$ (by significant digits)

(20%) Problem 1.3.B,D,F. By constructing the parallelogram of forces, determine the resultants for the pairs of forces shown in Figures 1.5 $b$, $d$ & $f$. (graphical addition)

Partial answers to check with:

- $R_b = 121\, \text{lb}$, $\theta_d = 22^\circ$ below $+x$,
- $R_f = 57\, \text{lb}$

(15%) Problem 1.3.I. Using graphical methods, find the resultant of the system of concurrent forces show in Figure 1.7 (i). (graphical addition)
(10%) **Problem 1.4.C.** Find the sense (tension or compression) and magnitude of the internal force in the member indicated in Figure 1.12 (c) using graphical methods. *(graphical addition to zero)*

![Figure 1.12](image)

(50%) **Problem 2.6.A.** Using the algebraic method of joints, find the internal forces in the truss in Figure 2.9 (a). *(method of joints)*

*Partial answers to check with:*

- $BH = 2401\, \text{lb (C)}$, $CI = 2000\, \text{lb (C)}$,
- $IJ = 812.5\, \text{lb (T)}$, $JG = 1250\, \text{lb (T)}$

![Figure 2.9](image)