

ENDS 231. Assignment #1

Date: 1/18/07, due 1/25/07

Pass-fail work

Problems: all but 1A & 1B from Onouye, Chapter 2.

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.)

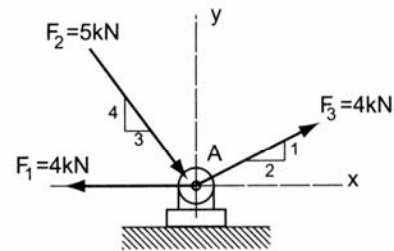
Partial answer to check with: 15,205.5 N

1B) You are given two measurements off a non-dimensional ruler of $A = 8.69$ and $B = 1.427$ marked in 100^{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.

Partial answers to check with: $A+B = 10.12$, $A \times B = 12.4006$

2.3.5 Determine the resultant using the sequence F_1 to F_2 to F_3 . Scale: 10 mm = 1 kN

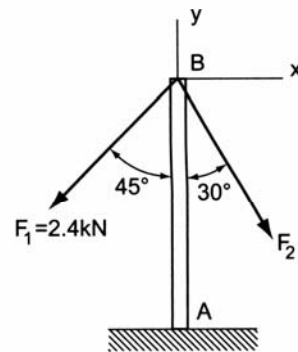
*Partial answers to check with: $R = 3.5$ kN,
 $\theta = 40^\circ$ below $+x$*



Problem 2.3.5

2.3.7 The resultant of the two forces F_1 and F_2 is vertical, down the axis of the pole AB. Determine the magnitude of F_2 . Scale: 1 mm = 40 N

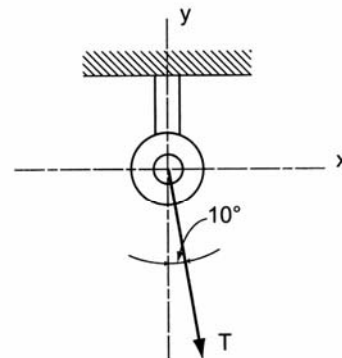
Partial answers to check with: $R \approx 4.5$ kN down



Problem 2.3.7

2.3.12 If a hook can sustain a maximum withdrawal force of 1 kN in the vertical direction, determine the maximum tension T that can be exerted.

Partial answers to check with: $T = 1.02$ kN

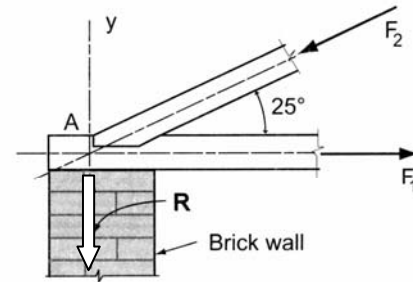


Problem 2.3.12

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2.3.22 One end of a timber roof truss is supported on a brick wall but not securely fastened. The resultant of the wall is only vertical. Assuming that the maximum capacity of either the inclined or horizontal member is 600 lb., determine the maximum magnitudes of F_1 and F_2 such that their resultant is vertical through the brick wall.

*Partial answers to check with: F_2 can be 662 lb.
OR F_1 can be 544 lb.*



Problem 2.3.22