Serie 1

Exercise 1:

The system in Fig.1 is in equilibrium with the string in the center exactly horizontal. Find (a) tension T1, (b) tension T2, (c) tension T3 and (d) angle θ .



Exercise 2:

Determine the values of the reactions R_A , and R_B , when a beam is simply supported at its ends and subjected to a downward force of 5 kN.



Exercise 3:

A beam 3 m long is simply supported at each end and carries loads as shown below. Calculate the reactions.



Exercise 4:

A steel bar of rectangular crosssection, 3 cm by 2 cm, carries an axial load of 30 kN. Estimate the average tensile stress over a normal crosssection of the bar.



Exercise 5:

An aluminum rod is rigidly attached between a steel rod and a bronze rod as shown in Fig. P-108. Axial loads are applied at the positions indicated. Find the maximum value of P that will not exceed a stress in steel of 140 MPa, in aluminum of 90 MPa, or in bronze of 100 MPa.



Exercise 6:

Two solid cylindrical rods AB and BC are welded together at B and loaded as shown. Knowing that $d_1=50 \text{ mm}$ and $d_2=30 \text{ mm}$, find the average normal stress at the midsection of (a) rod AB, (b) rod BC.

