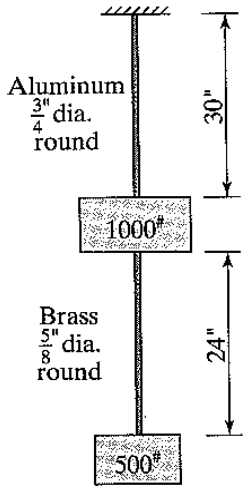
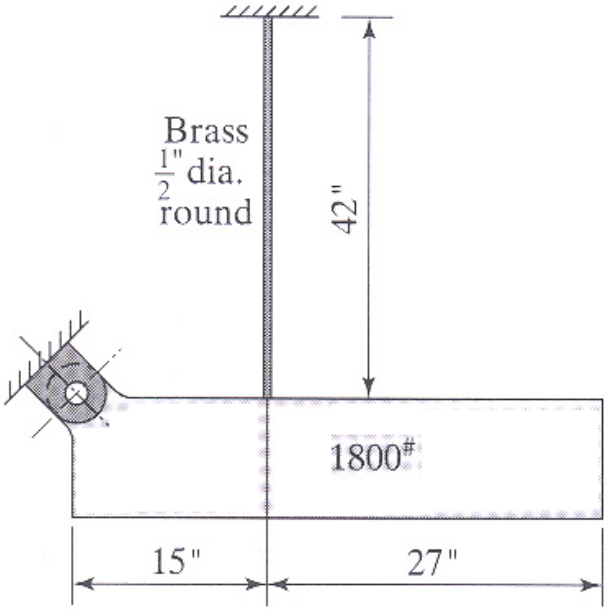
NOTE: Tables of material Properties such as modulus of elasticity (E) and coefficient of thermal expansion (α) of engineering materials are attached at the end.

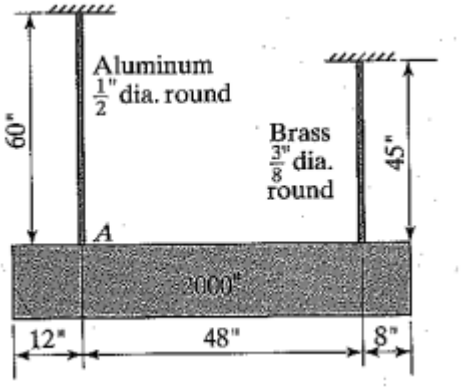
1. Find the drip of the 500-lb weight. Ans. 0.0128 in



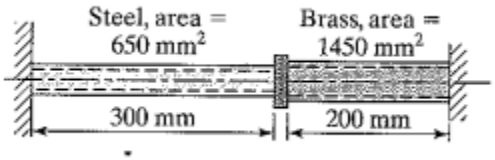
2. The bottom member is of uniform cross section and can be assumed to be rigid. The hinge is frictionless. Find the number of degrees of rotation of the lower member. Ans 0.137^{o}.



3. In the lower member is of uniform cross section and can be assumed to be rigid. Find the change in elevation of the left end because of the stretch of the rods.



4. The members in the figure below have a neat fit at the time of assembly. Find the force caused by an increase in the temperature of 50°C. Supports are immovable.



5. In the figure below, the outer bars are symmetrically placed with respect to the center bar. The top member is rigid and located symmetrically on the supports. Fing the load carried by each of the supports. Modulus of elasticity for the bars is 2,000,000 psi. Ans. Center 5161 lb; Outer 2419 lb.

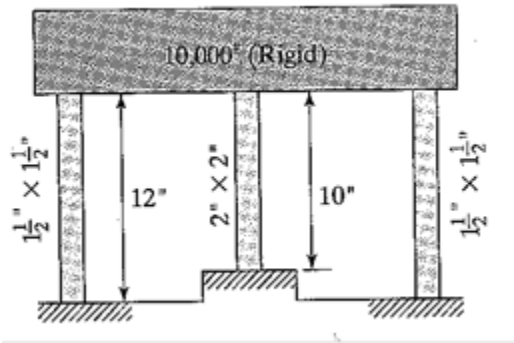


TABLE 2-3 AVERAGE VALUES FOR MECHANICAL PROPERTIES OF ENGINEERING MATERIALS.

Material	Modulus of Elasticity: Tension–Comp, E, psi	Modulus of Elasticity: Shear G, psi	Weight per Unit Volume, lb/in.^{3}	Coefficient of Linear Expansion, α in/(in. deg F)
Cast iron	See Table 14-16		0.256	0.000 0056
Steel	30,000,000	11,500,000	0.283	0.000 0065
Stainless steel 18-8	28,000,000	10,000,000	0.295	0.000 0096
Brass, bronze	15,000,000	5,300,000	0.30–0.32	0.000 0102
Aluminum	10,000,000	3,850,000	0.100	0.000 0128
Magnesium	6,500,000	2,400,000	0.065	0.000 0145

TABLE 2-3A AVERAGE VALUES FOR MECHANICAL PROPERTIES OF ENGINEERING MATERIALS IN SI UNITS.

Material	Modulus of Elasticity: Tension–Comp, E, N/mm^2 or MPa	Modulus of Elasticity: Shear, G, N/mm^2 or MPa	Weight per Unit Volume, N/mm^3	Coefficient of Linear Expansion, α, mm/(mm deg C)
Cast iron			0.000 0695	0.000 0100
Steel	206,900	79,300	0.000 0768	0.000 0117
Stainless steel 18-8	193,100	69,000	0.000 0800	0.000 0173
Brass, bronze	103,400	36,600	0.000 0814-869	0.000 0184
Aluminum	69,000	26,600	0.000 0271	0.000 0230
Magnesium	44,800	16,600	0.000 0176	0.000 0261