10-1

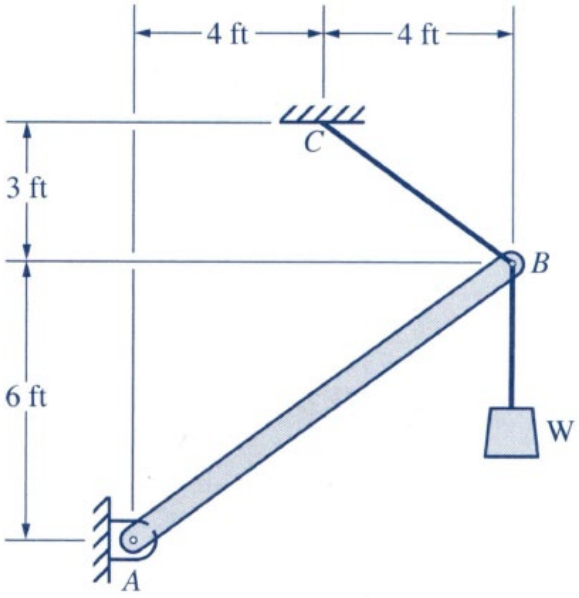
A 10-ft steel bar is subjected to a tensile stress of 20 ksi. Determine (a) the linear strain and (b) the total deformation of the bar. The modulus of elasticity of steel is 30×10^3 ksi.

10-3

A 20-ft wrought-iron bar ½ in. in diameter is subjected to a tensile force of 3 kips. Determine the stress, strain, and elongated length of the bar. The modulus of elasticity of wrought iron is $E = 29 \times 10^3$ ksi.

10-7

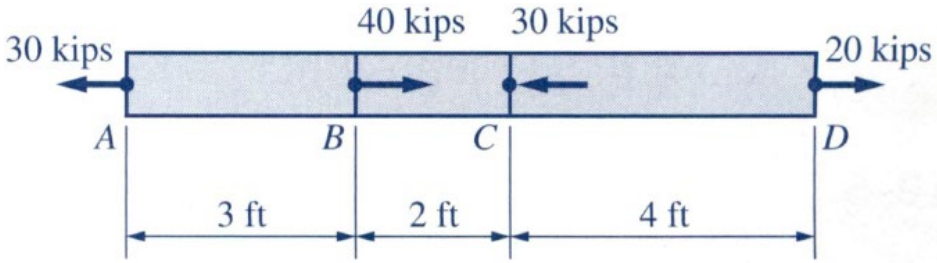
See Fig. P10-7. Determine the total elongation of cable BC due to a weight W = 600 lb if the cable has a cross-sectional area 0.025 $in.^2$ and is made of steel with E = 30 X 10^6 psi.



Solution.

10-9

A brass bar having a uniform cross-sectional area of 2 $in.^2$ is subjected to the forces shown in Fig. P10-9. Determine the total deformation of the bar. The modulus of elasticity of brass is $E = 17 \times 10^3$ ksi.

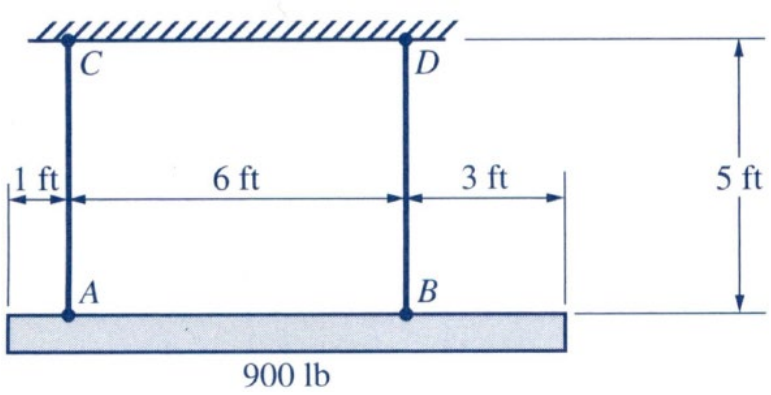


Solution.

10-12

The two wires shown in Fig. P10-12 support a heavy bar weighing 900 lb.

The wires AC and BD are identical, having the same ¾-in. diameter, the same 5-ft original length, and the same modulus of elasticity E = 30 x 10^6 psi. Determine the deformation of each wire.



Solution.

10-13

Determine the diameter of wire BD in Problem 10-12 so that the deformations of the two wires are equal. Other data remain unchanged.