18-1

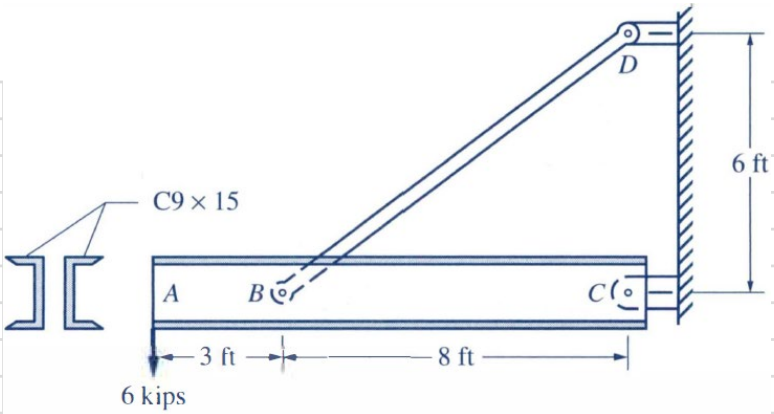
A beam of W16 x 50 section has a simple span of 20 ft. The beam is subjected to a uniform load of 2 kips/ft and an axial tensile force of 10 kips. Determine the maximum tensile and compressive stresses in the beam.

Solution.

18-4

A beam consisting of two standard C9 x 15 steel channels, arranged back to back as shown in Fig. P18-4, is subjected to a load of 6 kips. Determine the maximum tensile and compressive stresses along the beam.

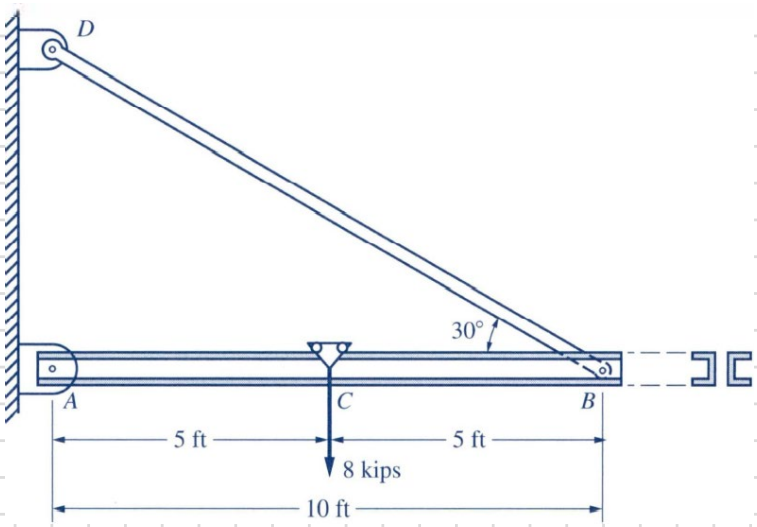
Solution.



18-5

The horizontal beam of the jib crane is made of two standard steel channels. The maximum load, including the weight of the moving cart that the crane is designed to carry, is 8 kips. If the allowable compressive stress is 15 ksi, select a proper size for the pair of channels.

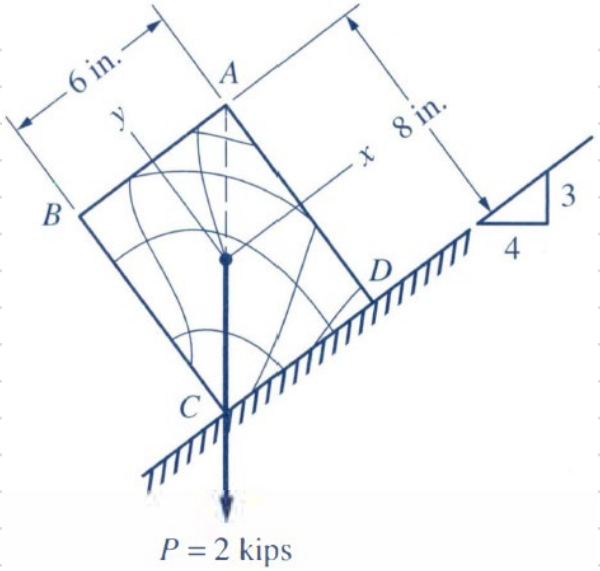
Solution.



18-8

The 10-ft-long, simply supported timber beam of full-size, 6-in. x 8-in. section is supported in such a way that the vertical concentrated load P = 2 kips applied at the centroid of the midspan passes through the diagonal AC, as shown. Find the normal stresses at points A, B, C, and D in the midspan due to the load.

Solution.



18-16

See Fig. P18-16. Determine the maximum eccentricity e at which the vertical compressive load P can be applied to the wide-flange W14 x 90 steel section without causing tensile stress any-where in the section. Neglect the weight of the section.

Solution.