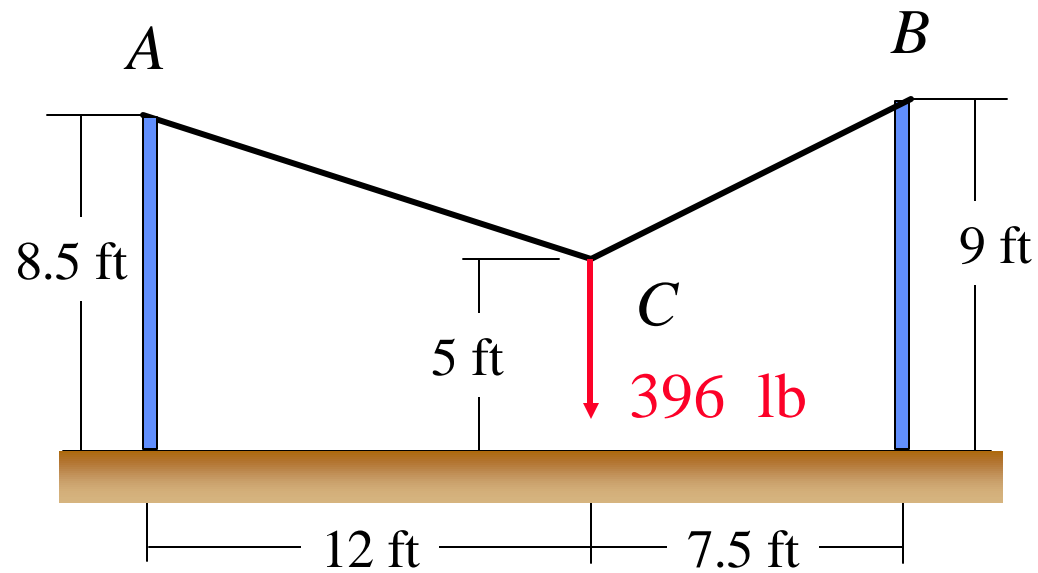
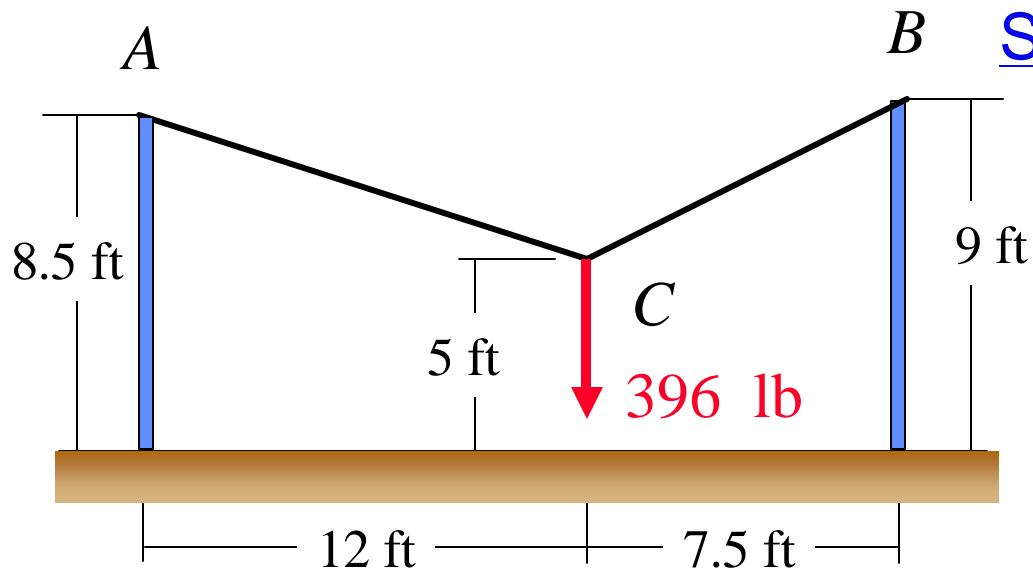


## Problem 2.134



Two cables are tied together at  $C$  and loaded as shown. determine the tension

- in cable  $AC$ ,
- in cable  $BC$ .

Solving Problems on Your Own

Two cables are tied together at  $C$  and loaded as shown. determine the tension (a) in cable  $AC$ , (b) in cable  $BC$ .

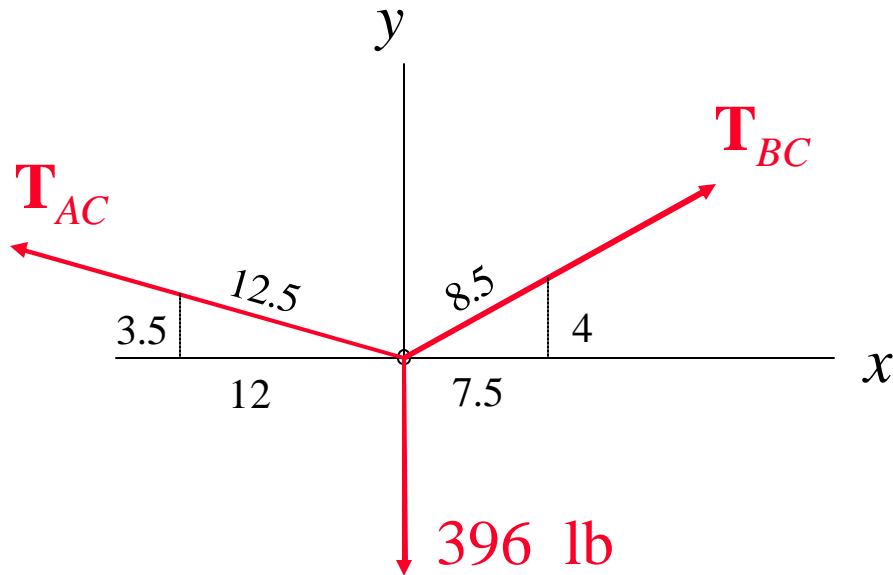
1. *Draw a free-body diagram of the particle.* This diagram shows the particle and all the forces acting on it.
2. *Set the resultant, or sum, of the forces exerted on the particle equal to zero.* You will obtain a vectorial equation consisting of terms containing the unit vectors  $\mathbf{i}$ ,  $\mathbf{j}$ , and  $\mathbf{k}$ . Three scalar equations result, which can be solved for the unknowns.

## FREE BODY C:

## Problem 2.134 Solution

*Draw a free-body diagram of the particle.*

*Set the resultant, or sum, of the forces exerted on the particle equal to zero.*

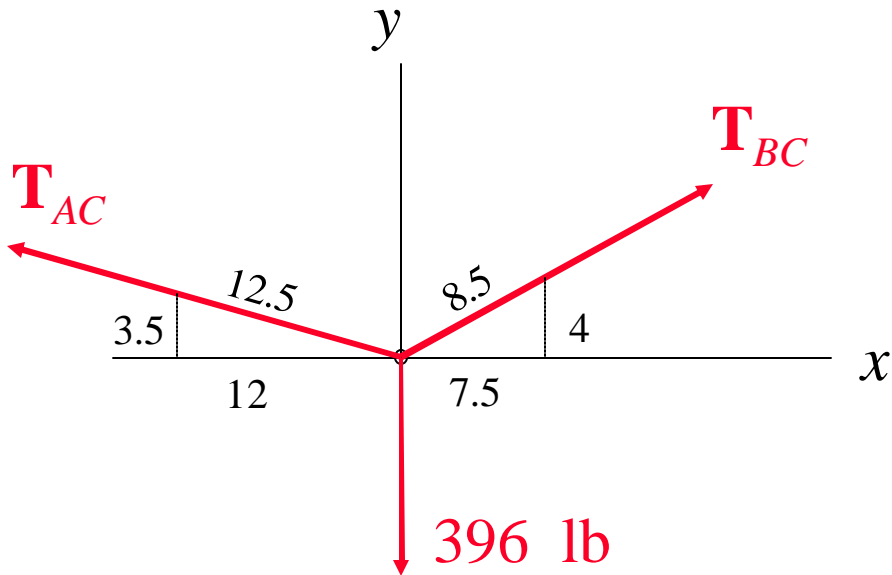


$$? F_x = 0 : -\frac{12}{12.5} T_{AC} + \frac{7.5}{8.5} T_{BC} = 0$$

$$T_{BC} = 1.088 T_{AC}$$

$$? F_y = 0 : \frac{3.5}{12.5} T_{AC} + \frac{4}{8.5} T_{BC} - 396 \text{ lb} = 0$$

## Problem 2.134 Solution



(a) Substitute for  $T_{BC}$ :

$$\frac{3.5}{12.5} T_{AC} + \frac{4}{8.5} (1.088 T_{AC}) - 396 \text{ lb} = 0$$

$$(0.280 + 0.512) T_{AC} - 396 \text{ lb} = 0$$

$$T_{AC} = 500 \text{ lb}$$

(b)  $T_{BC} = 1.088 (500 \text{ lb})$

$$T_{BC} = 544 \text{ lb}$$