

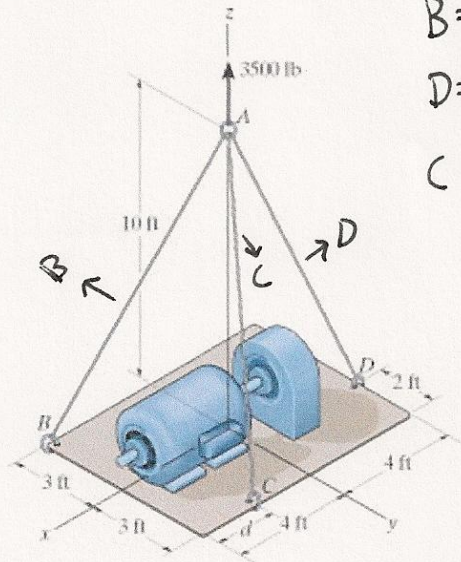
Determine the force in cable AB needed to support the 3500-lb platform. Set $d=2$ ft. Determine the force in cable AC. Determine the force in cable AD.

step ① Break cables into x, y, z components

$$B = 4\bar{i} - 3\bar{j} - 10\bar{k}$$

$$D = -4\bar{i} + 1\bar{j} - 10\bar{k}$$

$$C = 2\bar{i} + 3\bar{j} - 10\bar{k}$$



Step ② Take the magnitudes of $B, D, \& C$.

$$|B| = \sqrt{4^2 + 3^2 + 10^2} = 11.1803$$

$$|D| = \sqrt{4^2 + 1^2 + 10^2} = 10.8167$$

$$|C| = \sqrt{2^2 + 3^2 + 10^2} = 10.6301$$

step ③ Take unit vector of $B, D, \& C$

$$U_B = \frac{4}{11.1803}\bar{i} - \frac{3}{11.1803}\bar{j} - \frac{10}{11.1803}\bar{k} \rightarrow .35777\bar{i} - .2683\bar{j} - .89443\bar{k}$$

$$U_D = -.369798\bar{i} + .09245\bar{j} - .9245\bar{k}$$

$$U_C = .18814\bar{i} + .28222\bar{j} - .94073\bar{k}$$

Step ④ Solve simultaneous equations for $B, D, \& C$:

$$.35777B - .369798D + .18814C = 0$$

$$-.2683B + .09245D + .28222C = 0$$

$$-.89443B - .9245D - .94073C = 3500$$

Use calculator

$$B = 1.37 \text{ kip}$$

$$D = 1.70 \text{ kip}$$

$$C = .744 \text{ kip}$$