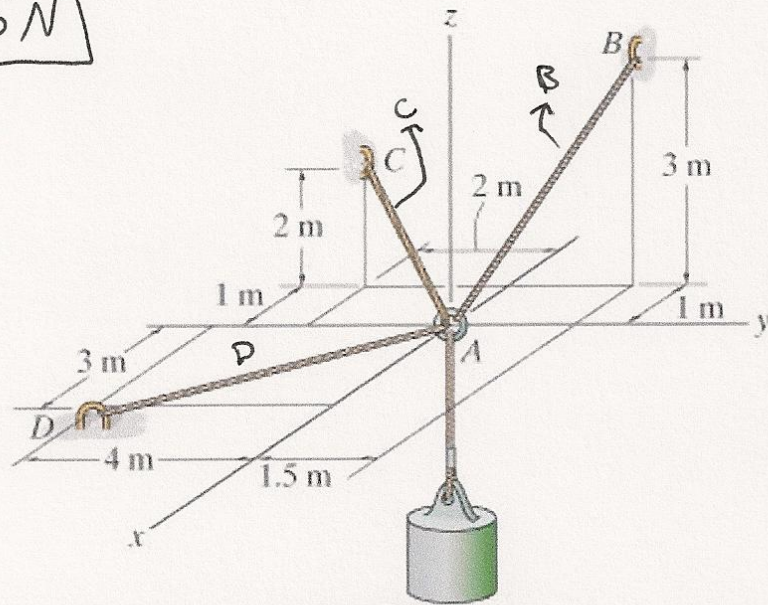


Determine the tension developed in cable AB required for equilibrium of the 75-kg cylinder. Determine the tension developed in cable AC. Determine the tension developed in cable AD.

$$75 \cdot 9.81 = 735.75 \text{ N}$$



$$B = -1\bar{i} + 1.5\bar{j} + 3\bar{k} \rightarrow |B| = \sqrt{1^2 + 1.5^2 + 3^2} = 3.5$$

$$C = -1\bar{i} - 2\bar{j} + 2\bar{k} \rightarrow |C| = \sqrt{1^2 + 2^2 + 2^2} = 3$$

$$D = 3\bar{i} - 4\bar{j} + 0\bar{k} \rightarrow |D| = \sqrt{3^2 + 4^2 + 0^2} = 5$$

$$\bar{u}_B = \frac{-1\bar{i} + 1.5\bar{j} + 3\bar{k}}{3.5} = -.2857\bar{i} + .42857\bar{j} + .85714\bar{k}$$

$$\bar{u}_C = \frac{-1\bar{i} - 2\bar{j} + 2\bar{k}}{3} = -.33333\bar{i} - .66666\bar{j} + .66666\bar{k}$$

$$\bar{u}_D = \frac{3\bar{i} - 4\bar{j} + 0\bar{k}}{5} = .6\bar{i} - .8\bar{j}$$

equations:

$$-.2857B - .33333C + .6D = 0$$

$$.42857B - .66666C - .8D = 0$$

$$.85714B + .66666C = 735.75$$

Solve with Calculator

$$B = 830.678 \text{ N}$$

$$C = 35.6137 \text{ N}$$

$$D = 415.327 \text{ N}$$