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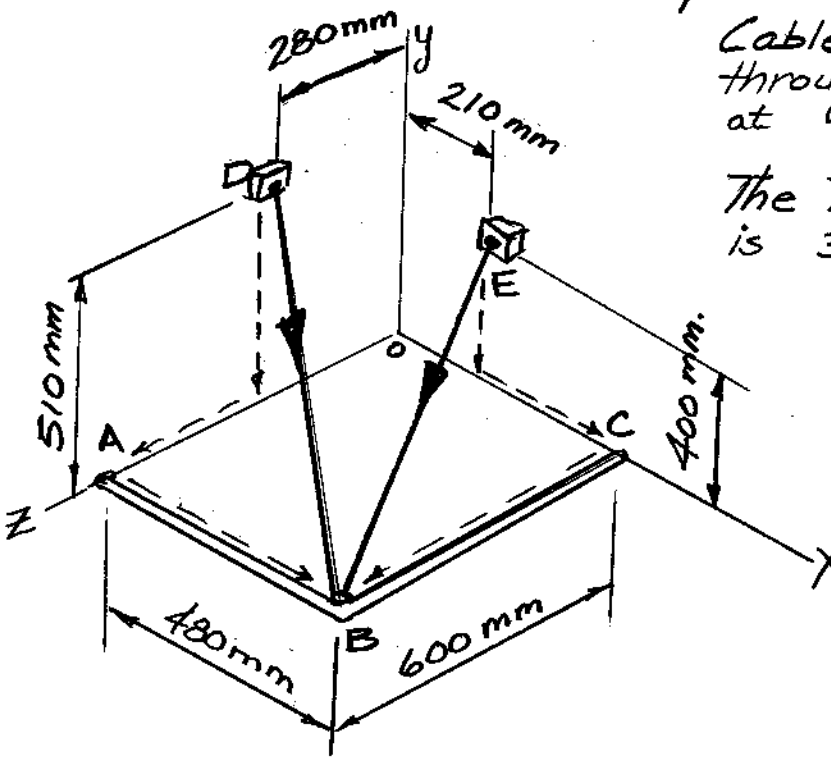
PROB. 2.89 + 90



Cable DBE passes through a frictionless ring at B.

The TENSION in cable DBE is 385 N. throughout.

Determine the force components of the force
- acting at D.
- acting at E.

$$\vec{F}_D = F\lambda_{DB} = 385^N\left[\frac{-510\hat{j} + (600-280)\hat{k} + 480\hat{i}}{\sqrt{510^2 + 320^2 + 480^2}}\right]$$

$$= \frac{385^N}{770\,mm/2}\left[480\hat{i} - 510\hat{j} + 320\hat{k}\right] =$$

$$\boxed{\vec{F}_D = 240^N\hat{i} - 255^N\hat{j} + 160^N\hat{k}}$$

$$\vec{F}_E = F\lambda_{EB} = 385^N\left[\frac{-400\hat{j} + (480-210)\hat{i} + 600\hat{k}}{\sqrt{400^2 + 270^2 + 600^2}}\right]$$

$$= \frac{385^N\left[270\hat{i} - 400\hat{j} + 600\hat{k}\right]}{770\,mm} =$$

$$\boxed{\vec{F}_E = 135^N\hat{i} - 200^N\hat{j} + 300^N\hat{k}}$$

? WHAT IS THE RESULTANT FORCE AT B ?

$$\vec{R} = \Sigma\vec{F}_B = \vec{F}_{BD} + \vec{F}_{BE}$$

$$= \left[-240\hat{i} + 255\hat{j} + 160\hat{k}\right] + \left[-135\hat{i} + 200\hat{j} - 300\hat{k}\right]$$

$$\vec{R} = -375\hat{i} + 455\hat{j} - 460\hat{k}$$

MAG. $|R| = \sqrt{375^2 + 455^2 + 460^2}$

$$\boxed{|R| = 747.83^N.}$$

PULLING AT PT. B.