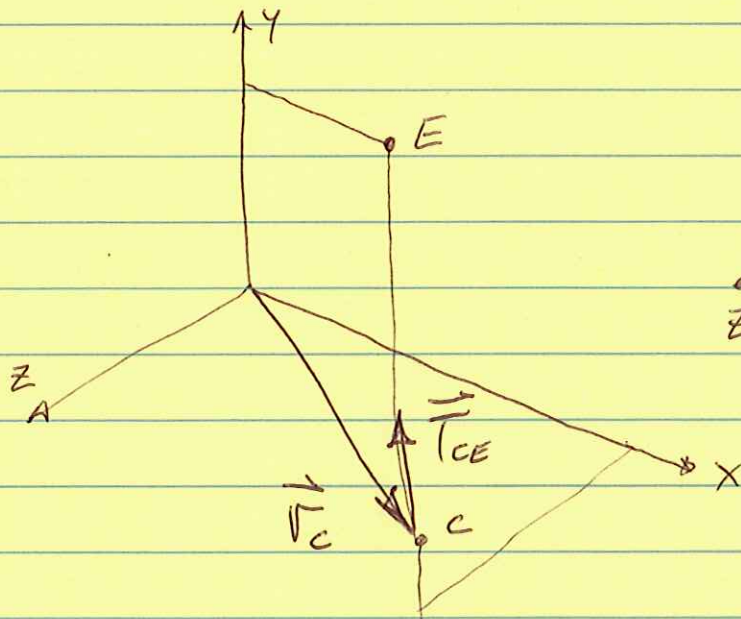


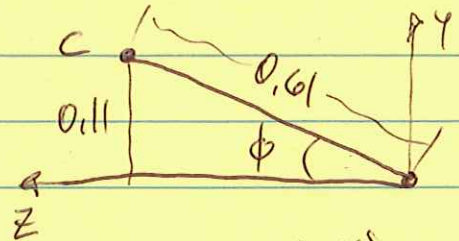
①

PROB. 3.48

$$|\vec{T}_{CE}| = 66^N, \text{ FIND } \vec{M}_O$$



LOCATE POINTS:



$$\phi = \tan^{-1}\left(\frac{0.11}{0.61}\right) = 10.2^\circ$$

$$z_c = 0.61 \cdot \cos 10.2^\circ$$

$$z_c = 0.6^m$$

$$C(1.0, 0.11, 0.6)^m, \quad E(0.3, 0.71, 0)$$

$$\vec{T}_{CE}: dx = x_E - x_C = 0.3 - 1 = -0.7^m$$

$$dy = y_E - y_C = 0.71 - 0.11 = 0.6^m$$

$$dz = z_E - z_C = 0 - 0.6 = -0.6^m$$

$$d = \sqrt{0.7^2 + 0.6^2 + 0.6^2} = 1.1^m$$

$$F_x = F \frac{dx}{d} = (66^N) \left( \frac{-0.7}{1.1} \right) = -42^N$$

$$F_y = F \frac{dy}{d} = (66^N) \left( \frac{0.6}{1.1} \right) = 36^N$$

PROB, 3.48 CONT.

(2)

$$F_z = F \frac{dz}{d} = (66) \left( \frac{-0.6}{1.1} \right) = -36 \text{ N}$$

$$\vec{T}_{CE} = (-42) \hat{i} + (36) \hat{j} + (-36) \hat{k} \text{ N}$$

$$\vec{r}_c = (1) \hat{i} + (0.11) \hat{j} + (0.6) \hat{k} \text{ m}$$

$$\vec{M}_o = \vec{r}_c \times \vec{T}_{CE} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 1 & 0.11 & 0.6 \\ -42 & 36 & -36 \end{vmatrix}$$

$$\vec{M}_o = [(0.11)(-36) - (0.6)(36)] \hat{i} - [(1)(-36) - (0.6)(-42)] \hat{j} \\ + [(1)(36) - (0.11)(-42)] \hat{k}$$

$$\vec{M}_o = (-25.6) \hat{i} + (10.8) \hat{j} + (40.6) \hat{k} \text{ N}\cdot\text{m}$$