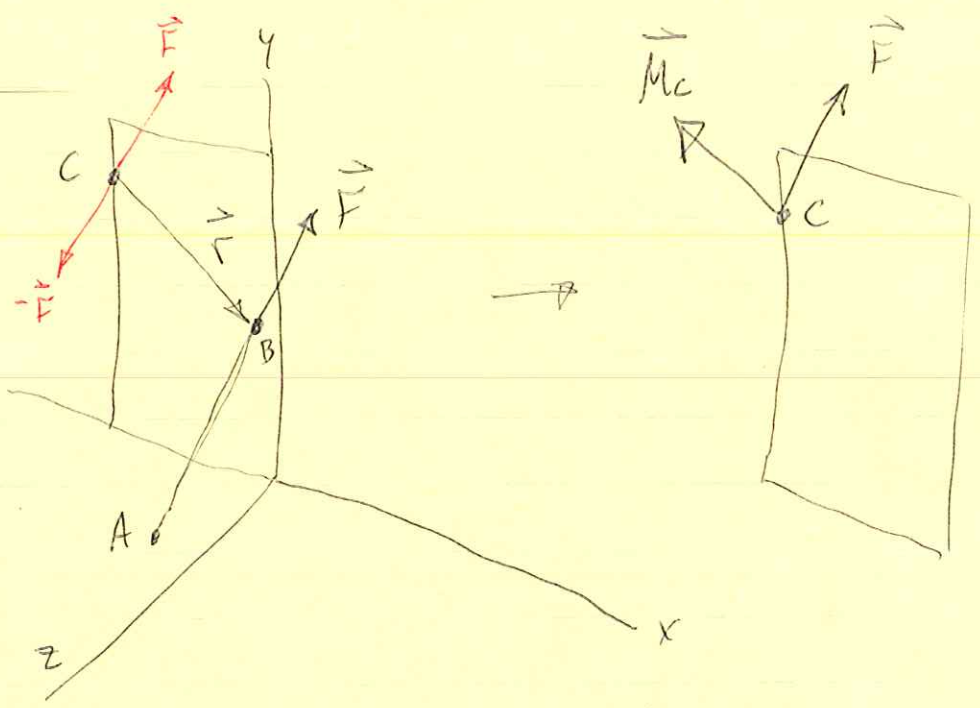


PROB. 3.96



FIND COORDINATES:

$$A(-100, 0, 594) \text{ mm}$$

$$A: X_A = -100 \text{ mm}, Y_A = 0, Z_A = 594 \text{ mm}$$

$$B(-67, 990, 0) \text{ mm}$$

$$B: X_B = -67 \text{ mm}, Y_B = 990 \text{ mm}, Z_B = 0$$

$$C(-750, 1850, 0) \text{ mm}$$

$$C: X_C = -750 \text{ mm}, Y_C = 1850 \text{ mm}, Z_C = 0$$

$$\text{FOR } \vec{F}: |\vec{F}| = 175 \text{ N}$$

$$dx = X_B - X_A = -67 - (-100) = 33 \text{ mm}$$

$$dy = Y_B - Y_A = 990 - 0 = 990 \text{ mm}$$

$$dz = Z_B - Z_A = 0 - 594 = -594 \text{ mm}$$

$$d = \sqrt{33^2 + 990^2 + 594^2} = 1155 \text{ mm}$$

$$F_x = \frac{Fdx}{d} = \frac{(175 \text{ N})(33 \text{ mm})}{1155 \text{ mm}} = 5 \text{ N}$$

$$F_y = \frac{Fdy}{d} = \frac{(175)(990)}{1155} = 150 \text{ N}$$

$$F_z = \frac{Fdz}{d} = \frac{(175)(-594)}{1155} = -90 \text{ N}$$

$$\vec{F} = (5)\hat{i} + (150)\hat{j} + (-90)\hat{k} \text{ N}$$

~~FOR~~ FOR  $\vec{r}$ :

$$dx = x_B - x_C = -67 - (-750) = 683 \text{ mm}$$

$$dy = y_B - y_C = 990 - 1850 = -860 \text{ mm}$$

$$dz = z_B - z_C = 0 - 0 = 0$$

$$\vec{r} = (683)\hat{i} + (-860)\hat{j} + (0)\hat{k} \text{ mm}$$

$$\vec{M}_C = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 683 & -860 & 0 \\ 5 & 150 & -90 \end{vmatrix}$$

PROB. 3.96 CONT.

(8)

$$\vec{M}_c = [(-860)(-90) - (0)(150)] \hat{i}$$

$$- [(683)(-90) - (0)(5)] \hat{j}$$

$$+ [(683)(150) - (-860)(5)] \hat{k}$$

$$\vec{M}_c = (77400) \hat{i} + (61470) \hat{j} + (106750) \hat{k} \text{ N-mm}$$

$$\vec{M}_c = (77.4) \hat{i} + (61.5) \hat{j} + (106.7) \hat{k} \text{ N-m}$$