

①

PROB. 3.97

$F = 110\text{ N}$, REPLACE WITH AN EQUIVALENT F/C SYSTEM AT ORIGIN.

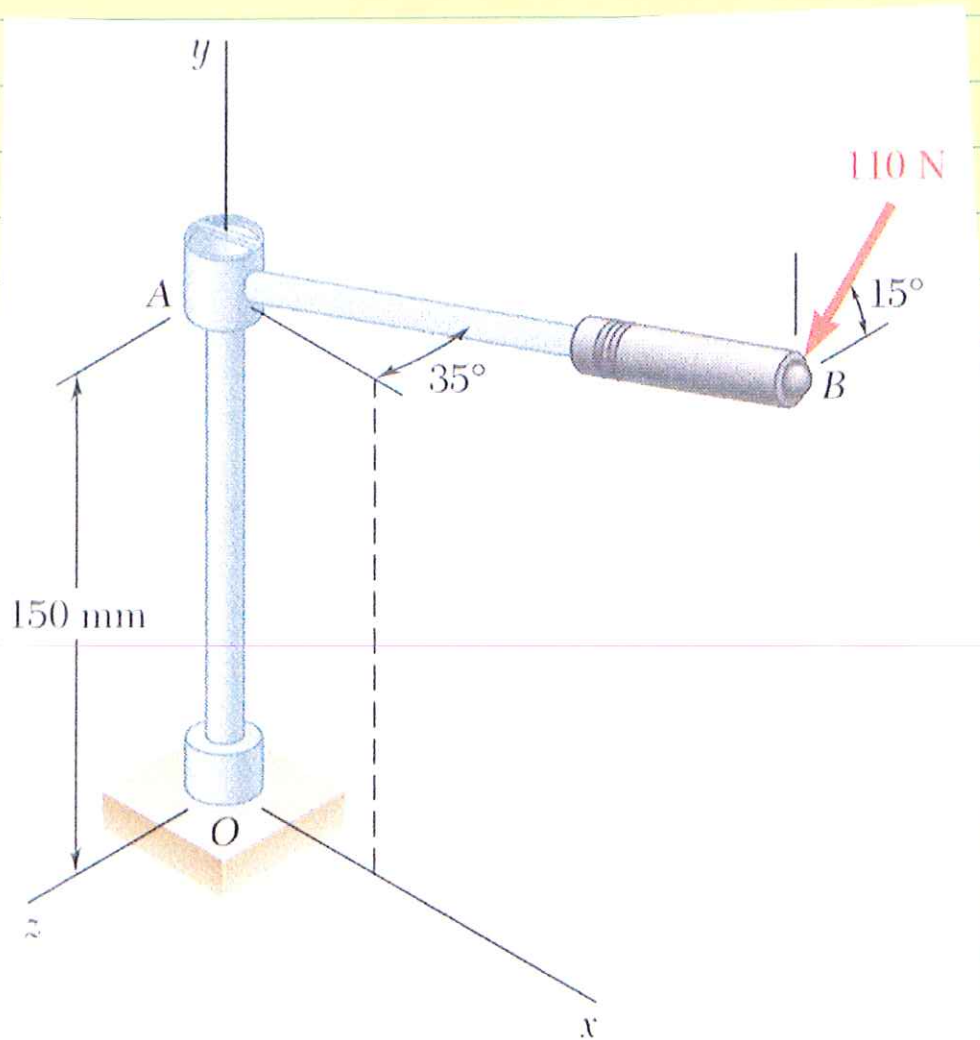


Fig. P3.97

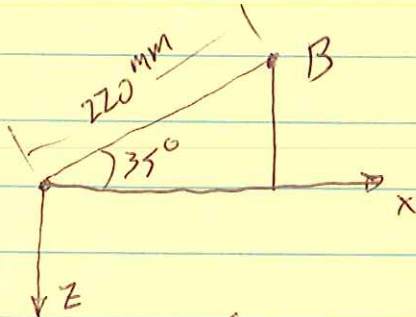
$$\vec{F}: F_x = 0, F_y = -110 \cdot \sin 15^\circ = -28.5\text{ N}$$

$$F_z = 110 \cdot \cos 15^\circ = 106.3\text{ N}, \quad \underline{\vec{F} = (-28.5)\hat{j} + (106.3)\hat{k}\text{ N}}$$

PROB. 3.97 CONT.

(2)

LOCATE POINT B: $Y_B = 150^{\text{mm}}$



$$X_B = 220 \cdot \cos 35^\circ = 180.2^{\text{mm}}$$

$$Z_B = -220 \cdot \sin 35^\circ = -126.2^{\text{mm}}$$

$$B(180.2, 150, -126.2)^{\text{mm}}$$

$$\vec{r} = (180.2)\hat{i} + (150)\hat{j} + (-126.2)\hat{k}^{\text{mm}}$$

$$\vec{M}_0 = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 180.2 & 150 & -126.2 \\ 0 & -28.5 & 106.3 \end{vmatrix}$$

$$\vec{M}_0 = [(150)(106.3) - (-126.2)(-28.5)]\hat{i}$$

$$- [(180.2)(106.3) - 0]\hat{j} + [(180.2)(-28.5) - 0]\hat{k}$$

$$\vec{M}_0 = (12,348)\hat{i} + (-19,134)\hat{j} + (-5,136)\hat{k}^{\text{N}\cdot\text{mm}}$$