STATICS

EXAMPLE 2-44

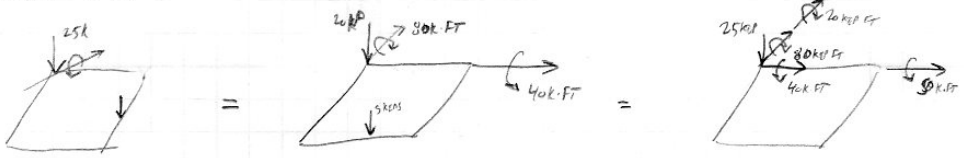
$$\vec{M}_O = \vec{r}_{OB} \times \vec{P}$$

$$= (15''\,\vec{i} + 16''\,\vec{j}) \times 200\,lbf \left(\underbrace{-\tfrac{16}{20}\,\vec{j} + \tfrac{12}{20}\,\vec{k}}_{\vec{\lambda}_{OB}}\right)$$

$$\vec{M}_o = 200\,lbf \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 15'' & 16'' & 0 \\ 0 & -\frac{4}{5} & \frac{3}{5} \end{vmatrix} = 200\,lbf \left(16 \times \tfrac{3}{5} - 0\right)\vec{i} - 200\,lbf\,(9-0)\,\vec{j} + \ldots\,\vec{k}$$

$$\vec{\lambda}_{OD} \cdot \vec{M}_o = \vec{\lambda}_{OD} \cdot (\vec{r}_{OB} \times \vec{P}) = \begin{vmatrix} \lambda_{OD_x} & \lambda_{OD_y} & \lambda_{OD_z} \\ 15'' & 16'' & 0 \\ 0 & -\frac{4}{5} & \frac{3}{5} \end{vmatrix}$$

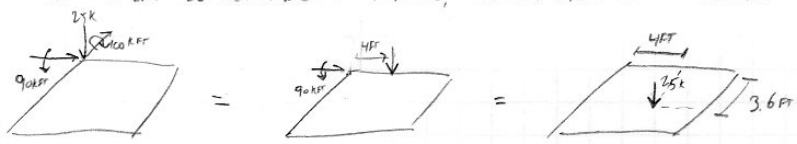
EXAMPLE 2-64



(a) $\vec{F} = -25\,\vec{j}$ kips

$\vec{M} = (90\,\vec{i} - 100\,\vec{k})$ FT·kips

WHEN MOMENT IS PERPENDICULAR TO FORCE, RESOLVE INTO SINGLE RESULTANT OF EQUIVALENT LOADING



$$\vec{M}_o = 90\,\vec{i} - 100\,\vec{k} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ X & 0 & Z \\ 0 & -25 & 0 \end{vmatrix}$$

PARALLEL AXIS THEOREM