EOP1 - MCR - 3C - 2302

$$\vec{F}_R = \Sigma\vec{F} = \vec{F}_1 + \vec{F}_2 + \vec{F}_3$$

$\vec{F}_1 = (65\,\hat{k})\ N$

$\vec{F}_2 = (-95\,\hat{k})\ N$

$\vec{F}_3 = (-180\,\hat{k})\ N$

(1)

$$\boxed{\therefore\ \vec{F}_R = (-210\,\hat{k})\ N}$$

$$(\vec{M}_R)_O = \Sigma\vec{M}_O + \Sigma\vec{M} = \vec{M}_O^{F_1} + \vec{M}_O^{F_2} + \vec{M}_O^{F_3} = \boxed{(-15\,\hat{i} + 213.75\,\hat{j})\ N\cdot m}$$

8:00

$$\vec{M}_O^{F_1} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 2 & 0.5 & 0 \\ 0 & 0 & 65 \end{vmatrix} = (32.5\,\hat{i} - 130\,\hat{j})\ N\cdot m$$

$$\vec{M}_O^{F_2} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 1.25 & 0.5 & 0 \\ 0 & 0 & -95 \end{vmatrix} = (-47.5\,\hat{i} + 118.75\,\hat{j})\ N\cdot m$$

$$\vec{M}_O^{F_3} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 1.25 & 0 & 0 \\ 0 & 0 & -180 \end{vmatrix} = (225\,\hat{j})\ N\cdot m$$

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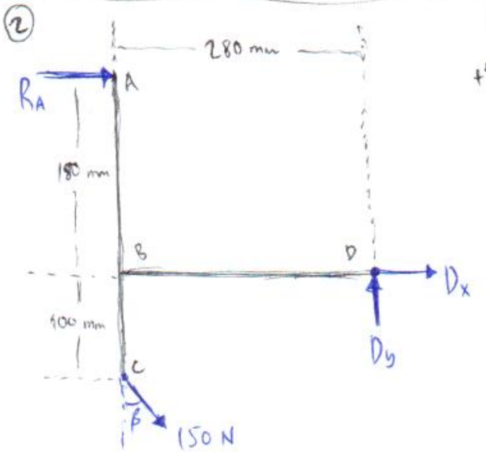
(2)



- Ecs. de equilibrio:

$$+\circlearrowleft \Sigma M_D = 0 \rightarrow -R_A(180) + 150\cos\beta\,(280) + 150\,\text{sen}\,\beta\,(100) = 0$$

$$\boxed{\therefore\ R_A = 243.7\ N}$$

8:30

$$\overset{+}{\rightarrow}\Sigma F_x = 0;\quad R_A + D_x + 150\,\text{sen}\,\beta = 0 \rightarrow D_x = -318.7\ N$$

$$\therefore\ \boxed{D_x = 318.7\ N \leftarrow}$$

$$+\uparrow \Sigma F_y = 0;\quad -150\cos\beta + D_y = 0 \rightarrow \boxed{D_y = 129.9\ N}$$