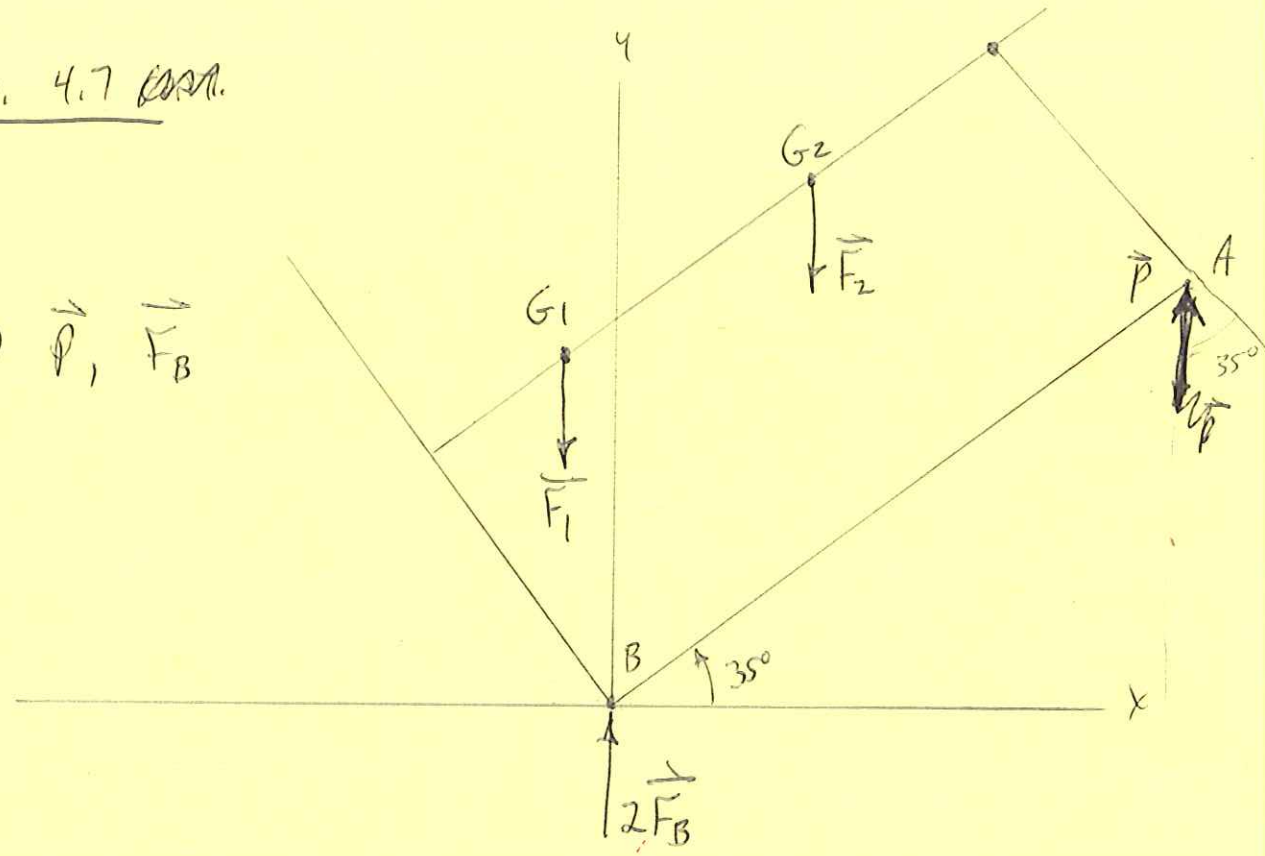
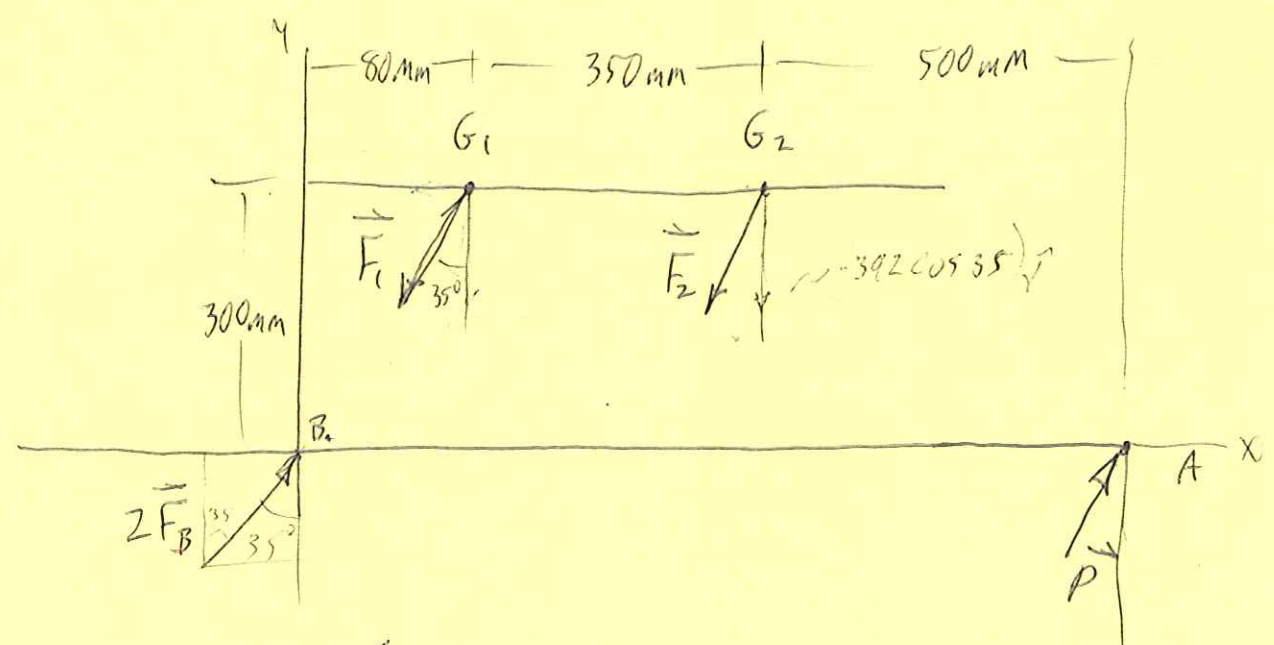


PROB. 4.7 CONT.

FIND  $\vec{P}$ ,  $\vec{F}_B$



ROTATE COORDINATES:



FIND COORDINATES / POSITION VECTORS

$$\vec{r}_{G_1} = (80)\hat{i} + (300)\hat{j} \text{ mm}$$

PROB. 4.7 CONT

$$\vec{r}_{G2} = (430)\hat{i} + (300)\hat{j} \text{ mm}$$

$$\vec{r}_A = (930)\hat{i} + (0)\hat{j} \text{ mm}$$

FIND VECTORS:

$$\vec{F}_B = (F_B \sin 35^\circ)\hat{i} + (F_B \cos 35^\circ)\hat{j} \text{ N}$$

$$\vec{F}_B = (0.573 F_B)\hat{i} + (0.819 F_B)\hat{j} \text{ N}$$

~~$\vec{F}_1 = 40 \text{ N}$~~

$$|\vec{F}_1| = (40 \text{ kg})(9.8 \frac{\text{m}}{\text{s}^2}) = 392 \text{ N}$$

$$|\vec{F}_2| = 392 \text{ N}$$

$$\vec{F}_1 = (-392 \sin 35^\circ)\hat{i} + (-392 \cos 35^\circ)\hat{j} \text{ N}$$

$$\vec{F}_1 = (-225)\hat{i} + (-321)\hat{j} \text{ N}$$

$$\vec{F}_2 = (-225)\hat{i} + (-321)\hat{j} \text{ N}$$

$$\vec{P} = (0.573 P)\hat{i} + (0.819 P)\hat{j} \text{ N}$$

PROB. 4.7 CONT.

$$\sum M_B = 0$$

$$\vec{r}_{G1} \times \vec{F}_1 + \vec{r}_{G2} \times \vec{F}_2 + \vec{r}_A \times \vec{P} = 0$$

$$\vec{M}_1 = \vec{r}_{G1} \times \vec{F}_1 = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 80 & 300 & 0 \\ -225 & -321 & 0 \end{vmatrix}$$

$$\vec{M}_1 = (0)\hat{i} + (0)\hat{j} + [(80)(-321) - (300)(-225)]\hat{k} \text{ N-mm}$$

$$\vec{M}_1 = (41800)\hat{k} \text{ N-mm}$$

$$\vec{M}_2 = \vec{r}_{G2} \times \vec{F}_2 = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 430 & 300 & 0 \\ -225 & -321 & 0 \end{vmatrix}$$

$$\vec{M}_2 = (0)\hat{i} + (0)\hat{j} + [(430)(-321) - (300)(-225)]\hat{k} \text{ N-mm}$$

$$\vec{M}_2 = (-70500)\hat{k} \text{ N-mm}$$

$$\vec{M}_3 = \vec{r}_A \times \vec{P} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 930 & 0 & 0 \\ 0.573P & 0.819P & 0 \end{vmatrix}$$

$$\vec{M}_3 = (0)\hat{i} + (0)\hat{j} + [(930)(0.819P) - (0)]\hat{k} \text{ N-mm}$$

$$\vec{M}_3 = (762P)\hat{k} \text{ N-mm}$$

PROB. 4.7 CONT.

$$(41800) + (-70500) + (762P) = 0$$

$$\boxed{P = 37.7 \text{ N}}$$

~~AGAIN~~

NOW USE FIRST DIAGRAM:

$$\underline{\Sigma F_y = 0}$$

$$2F_B = F_1 + F_2 + P$$

$$F_B = \frac{1}{2} [(392) + (392) + (37.7)]$$

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$$\boxed{F_B = 373 \text{ N}}$$