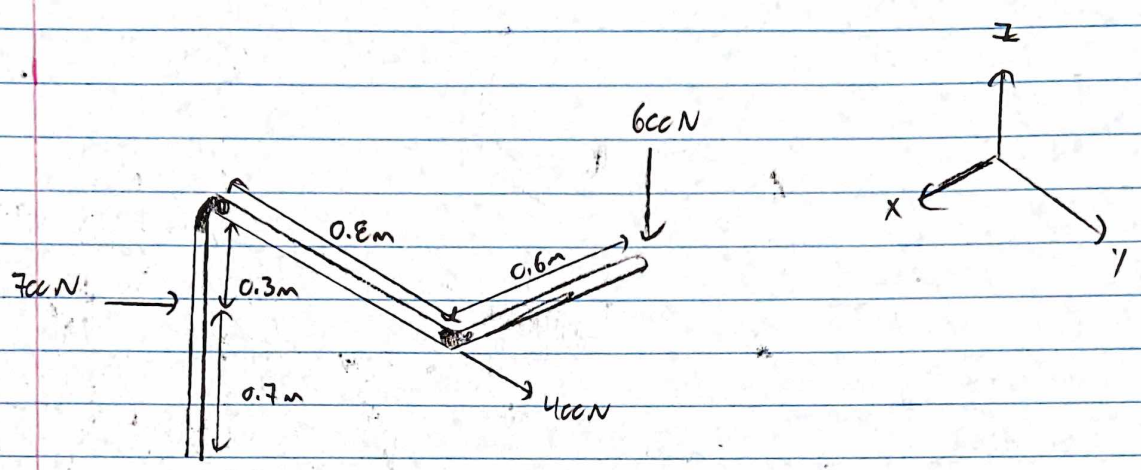
Solutions! 21-S-4.7-MR-03



$$\mathbf{f_R} = -700\,\hat{i} + 400\,\hat{j} - 600\,\hat{k}$$

$f_1 = -700\,\hat{i}$ $\quad f_2 = 400\,\hat{j}$ $\quad f_3 = -600\,\hat{k}$

$r_1 = 0\hat{i} + 0\hat{j} + 0.7\hat{k}$ $\quad r_2 = 0\hat{i} + 0.8\hat{j} + 1\hat{k}$ $\quad r_3 = -0.6\,\hat{i} + 0.8\,\hat{j} + 1\hat{k}$

$M_1 = r_1 \times f_1 =$

$\hat{i}$	$\hat{j}$	$\hat{k}$	$\hat{i}$	$\hat{j}$
0	0	0.7	0	0
-700	0	0	-700	0

$(-700)(0.7)\hat{j} = -490\,\hat{j}$ Nm

$M_2 = r_2 \times f_2 =$

$\hat{i}$	$\hat{j}$	$\hat{k}$	$\hat{i}$	$\hat{j}$
0	0.8	1	0	0.8
0	400	0	0	400

$-(400)(1)\,\hat{i} = -400\,\hat{i}$ Nm

$M_3 = r_3 \times f_3 =$

$\hat{i}$	$\hat{j}$	$\hat{k}$	$\hat{i}$	$\hat{j}$
-0.6	0.8	1	-0.6	0.8
0	0	-600	0	0

$= (-600)(0.8)\,\hat{i} - (-600)(0.6)\,\hat{j}$

$-480\,\hat{i} + 360\,\hat{j}$

$M = (-400\,\hat{i} - 480\,\hat{i}) + (-490\,\hat{j} + 360\,\hat{j}) + 0\hat{k}$

$$\mathbf{M} = -880\,\hat{i} - 850\,\hat{j} + 0\,\hat{k}$$