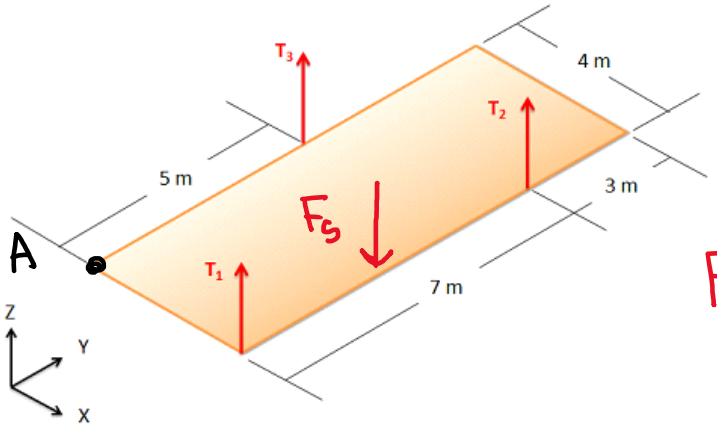
Question 8

A sixty kilogram acoustic panel is suspended by three cables as shown below. Assuming the panel has a uniformly distributed weight, what is the tension in each of the cables?



$$F_s = (60)(9.81)$$
$$= 588.6\ N$$

$$\Sigma F_y = T_1 + T_2 + T_3 - 588.6 = 0$$

Take moments about A $\qquad \vec{M} = \vec{r} \times \vec{F}$

$$\vec{M}_{T_1} = [4,0,0] \times [0,0,T_1] = [0, -4T_1, 0]$$
$$\vec{M}_{T_2} = [4,7,0] \times [0,0,T_2] = [7T_2, -4T_2, 0]$$
$$\vec{M}_{T_3} = [0,5,0] \times [0,0,T_3] = [5T_3, 0, 0]$$
$$\vec{M}_{F_s} = [2,5,0] \times [0,0,-588.6] = [-2943, 1177, 0]$$

$$\Sigma M_x = 7T_2 + 5T_3 - 2943 = 0$$
$$\Sigma M_y = -4T_1 - 4T_2 + 1177 = 0$$

$\sum F_y \qquad \sum M_x \qquad \sum M_y$

plug into equation solver

$T_1 = 84.1\ N$

$T_2 = 210.2\ N$

$T_3 = 294.4\ N$