## Question 4:

A 12 in by 24 in flat steel sign is supported by two cables, each 6 inches from the edge of the sign. The sign has a weight of 10 lbs, and the wind is causing the sign to sit at an angle of 10 degrees from vertical (the y axis). If we treat the wind as a point force acting in the negative z direction on the center of the sign, how strong must the wind force be to cause this ten degree angle?
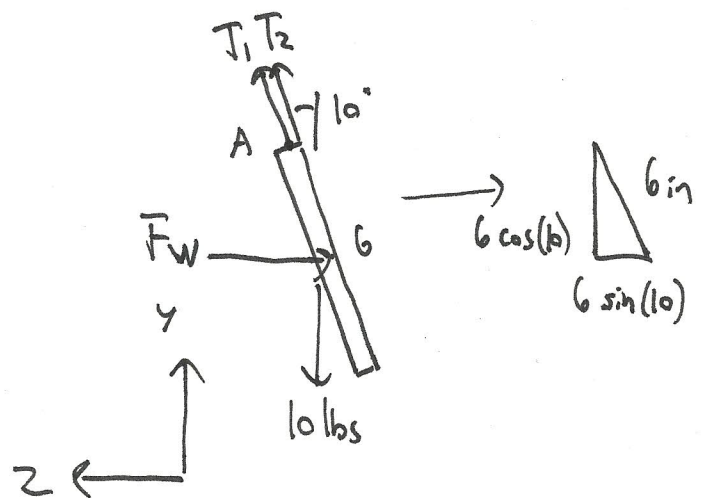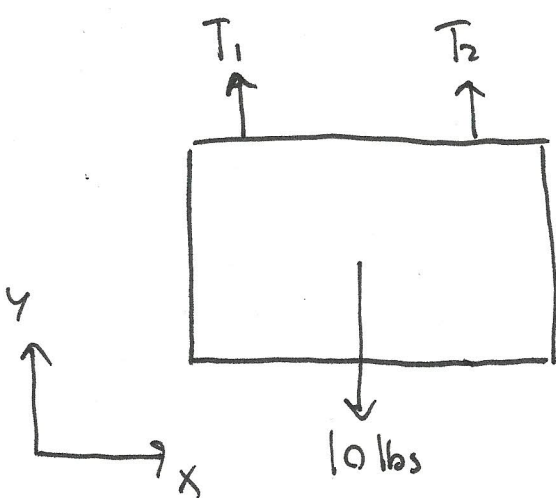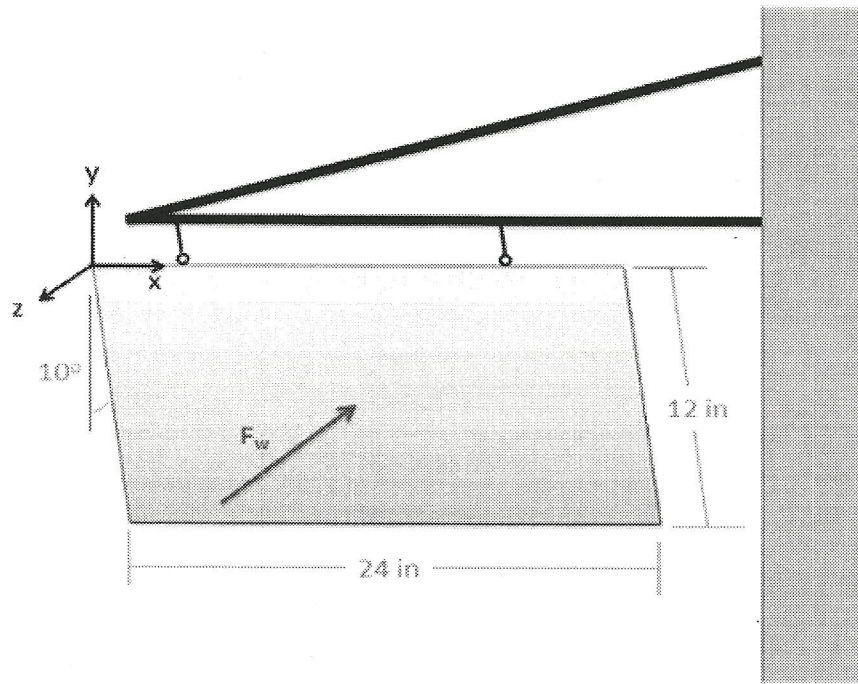
$$\sum F_x = 0 = 0$$

$$\sum F_y = T_1 \cos(10) + T_2 \cos(10) - 10 \text{ lbs} = 0$$

$$\sum F_z = - F_w + T_1 \sin(10) + T_2 \sin(10) = 0$$

$$\sum M_{AX} = (F_w)(6\cos(10)) - (10)(6\sin(10)) = 0$$

$$F_w = \frac{(10)(6\sin(10))}{6\cos(10)}$$

$$\boxed{F_w = 1.76 \text{ lbs}}$$