A 2.20 \times 10^3 \text{ N} uniform beam is attached to an overhead beam as shown in the drawing. A 3.60 \times 10^3 \text{ N} trunk hangs from an attachment to the beam two-thirds of the way down from the upper connection of the beam to the overhead support. A cable is tied to the lower end of the beam and is also attached to the wall on the right.

A. [80 pts.] What is the tension in the cable connecting the lower end of the beam to the wall? USE ROT. EQUIL.

\[ \sum F_T = \sum \tau = 0 \]
\[ = F_{Tv} + \tau_{FH} + \tau_{WB} + \tau_{Wk} + T \]
\[ = 0 + 0 - W_B l_B - W_k l_k + T l_T \]
\[ = - (2.2 \times 10^3 \text{ N})(\frac{2}{3} \text{ L} \sin 37^\circ) - (3.6 \times 10^3 \text{ N})(\frac{2}{3} \text{ L} \sin 37^\circ) + T l_T \]
\[ = \frac{2}{3} \text{ L} \sin 37^\circ \]
\[ T = (2.2 \times 10^3 \text{ N})(0.3) + (3.6 \times 10^3 \text{ N})(0.4) \]
\[ T = 2100 \text{ N} \]

B. [5 pts.] What are the vertical and horizontal components of the force the overhead beam exerts on the upper end of the beam at P? USE TRANSLATIONAL EQUILIBRIUM

\[ \sum F_x = 0 = T \cos 37^\circ - F_{H} \]
\[ F_{H} = (2100 \text{ N})(0.8) \]
\[ F_{H} = 1680 \text{ N} \]

\[ \sum F_y = 0 = F_v + T \sin 37^\circ - W_B - W_k \]
\[ F_v = 2.2 \times 10^3 \text{ N} + 3.6 \times 10^3 \text{ N} - (2100 \text{ N})(0.6) \]
\[ F_v = 4540 \text{ N} \]