22. (a) The sign is attached in two places: at x_1 = 1.00 m (measured rightward from the hinge) and at x_2 = 3.00 m. We assume the downward force due to the sign's weight is equal at these two attachment points: each being *half* the sign's weight of mg. The angle where the cable comes into contact (also at x_2) is

$$\theta = \tan^{-1}(d_v/d_h) = \tan^{-1}(4.00 \text{ m}/3.00 \text{ m})$$

and the force exerted there is the tension T. Computing torques about the hinge, we find

$$T = \frac{\frac{1}{2} mgx_1 + \frac{1}{2} mgx_2}{x_2 \sin\theta} = \frac{\frac{1}{2}(50.0 \text{ kg})\left(9.8 \text{ m/s}^2\right)(1.00 \text{ m}) + \frac{1}{2}(50.0 \text{ kg})(9.8 \text{m/s}^2)(3.00 \text{ m})}{(3.00 \text{ m})(0.800)}$$
$$= 408 \text{ N}.$$

(b) Equilibrium of horizontal forces requires the (rightward) horizontal hinge force be

$$F_x = T\cos\theta = 245 \text{ N}.$$

(c) And equilibrium of vertical forces requires the (upward) vertical hinge force be

$$F_y = mg - T\sin\theta = 163 \text{ N}.$$