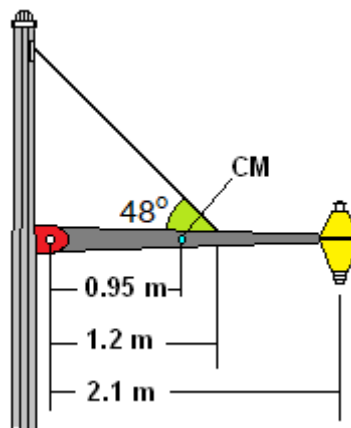# Physics I

Statics with poles

First condition of equilibrium $\sum F_x = 0$ and $\sum F_y = 0$
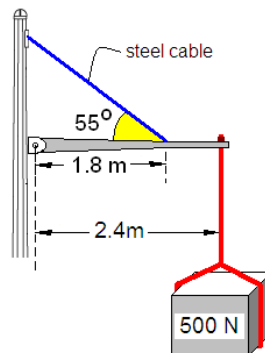
Second condition of equilibrium $\sum \tau = 0$ where $\tau = \pm Fr \sin \angle_F^r$

Law of sines $\dfrac{F_1}{\sin \theta_1} = \dfrac{F_2}{\sin \theta_2} = \dfrac{F_3}{\sin \theta_3}$
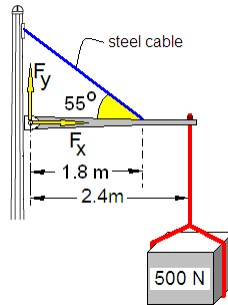
Problem 1.- Find the tension in the cable. The weight of the lamp is 80N, the weight of the horizontal pole is 150N and its center of mass is 0.95 m from the left side (it is a tapered shape, so it is not in the middle).
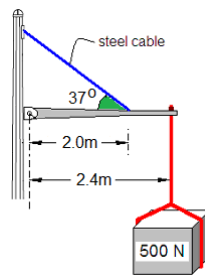

Problem 2.- Calculate the tension (force) in the cable. Neglect the weight of the pole.
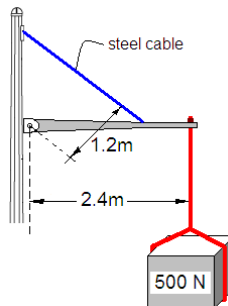
Problem 2a.- Calculate the horizontal force (F_x) acting on the hinge. Neglect the weight of the pole.

steel cable

F_y

55°

F_x

1.8 m

2.4m

500 N

Problem 3.- Calculate the tension on the steel cable. Neglect the weight of the pole.

steel cable

37°

2.0m

2.4m

500 N

Problem 4.- Calculate the tension (force) on the cable. Neglect the weight of the pole.

steel cable

1.2m

2.4m

500 N

Problem 5.- Calculate the tension force in the cable and the reaction at the hinge. The block has a weight of 500 N, and we can neglect the weight of the supporting pole.

2.4m

2.0m

500 N