STATIC EQUILIBRIUM – Bars & Cables-KEY
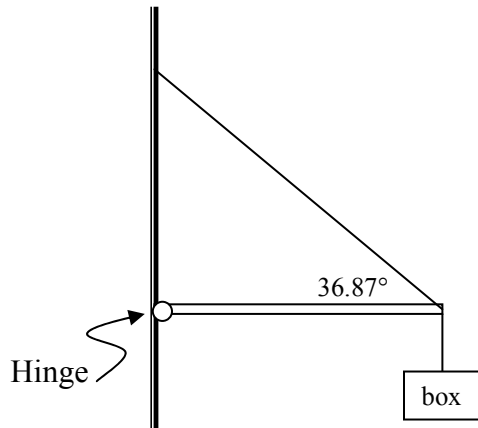$$\Sigma F = 0 \ \& \ \Sigma \tau = 0$$

[1] Find the tension in the cable _and_ both the horizontal and vertical components that the hinge supplies to the bar (remember direction).
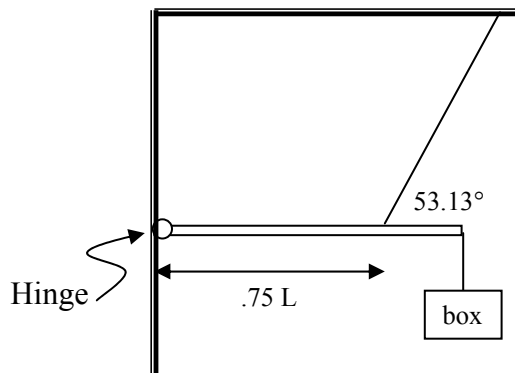Note: The bar is 120 kg, the box is 60 kg & 12 meters long

T=2,000 N
F_{Hx}=1,600 N right
F_{Hy}=600 N up

36.87°

Hinge

box

[2] Find the tension in the cable _and_ both the horizontal and vertical components that the hinge supplies to the bar (remember direction).
Note: The bar is 60 kg, the box is 60 kg & "L" meters long

T=1,500 N
F_{Hx}=900 N left
F_{Hy}=0 N

53.13°

Hinge

.75 L
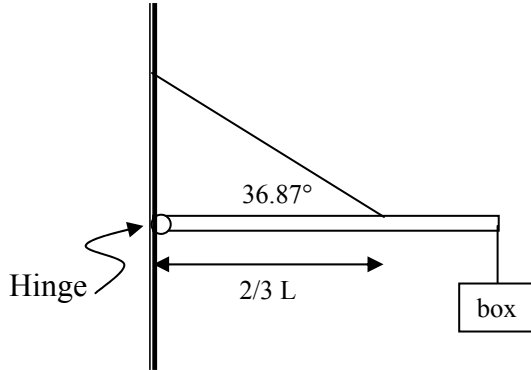
box

STATIC EQUILIBRIUM – Bars & Cables

$$\Sigma F = 0 \quad \& \quad \Sigma \tau = 0$$

[3] If the maximum tension of the cable is 1,000 N, what is the greatest the mass of the box could be without the rope breaking? What are the horizontal and vertical components that the hinge supplies to the bar when the greatest mass box is suspended (remember direction)? Note: The bar is 66 2/3 N.

53.13°

Hinge

2/3 L

box
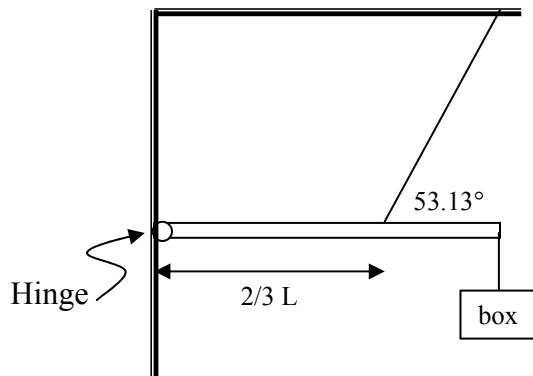
$mass_{max}$=50 kg
F_{Hx}=600 N right
F_{Hy}=233 1/3 N down

[4] What mass box should be suspended so that the vertical component that the hinge supplies to the bar is zero? Note: The bar is 120 N.

mass=6 kg

36.87°

Hinge

2/3 L

box