

Physics U5 12 Torque Work Sheet #2

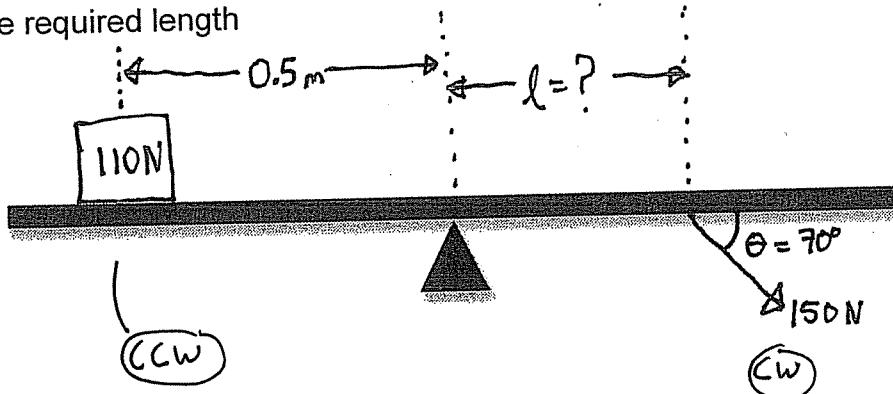
Name: _____

Date: _____

$$\tau_{ccw} = \tau_{cw}$$

$$\tau = F \cdot l \cdot \sin \theta$$

1. Find the required length



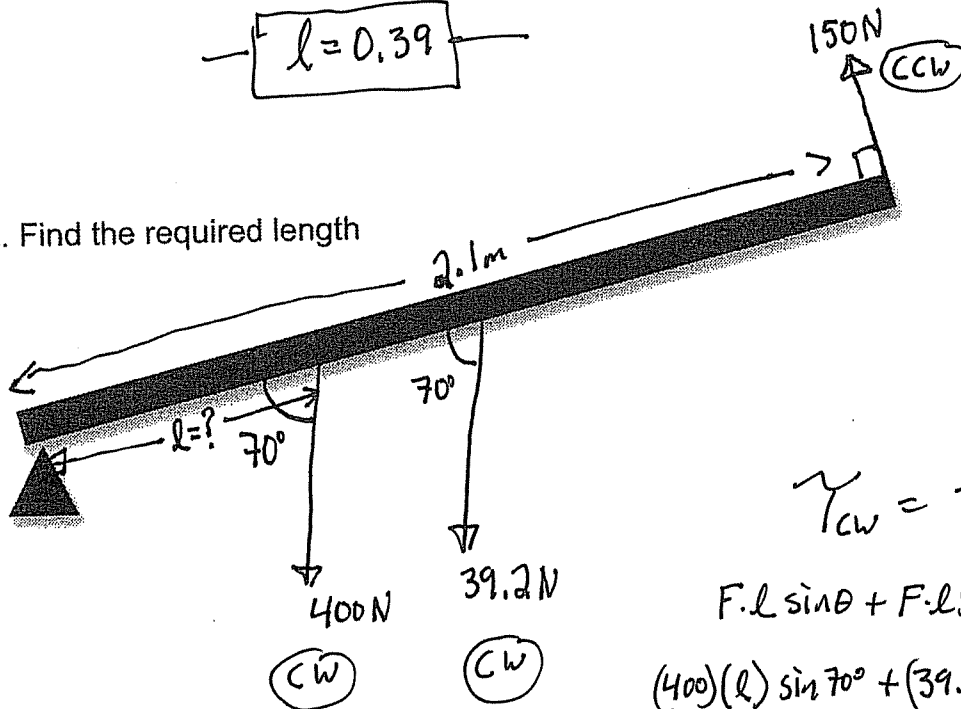
mass of beam = 0

$$\tau_{ccw} = \tau_{cw}$$

$$(110)(0.5) = (150)(\sin 70^\circ)l$$

$$l = 0.39$$

2. Find the required length



mass of beam = 4kg

$$F_g = 39.2 \text{ N}$$

$$\tau_{cw} = \tau_{ccw}$$

$$F \cdot l \sin \theta + F \cdot l \sin \theta = F \cdot l$$

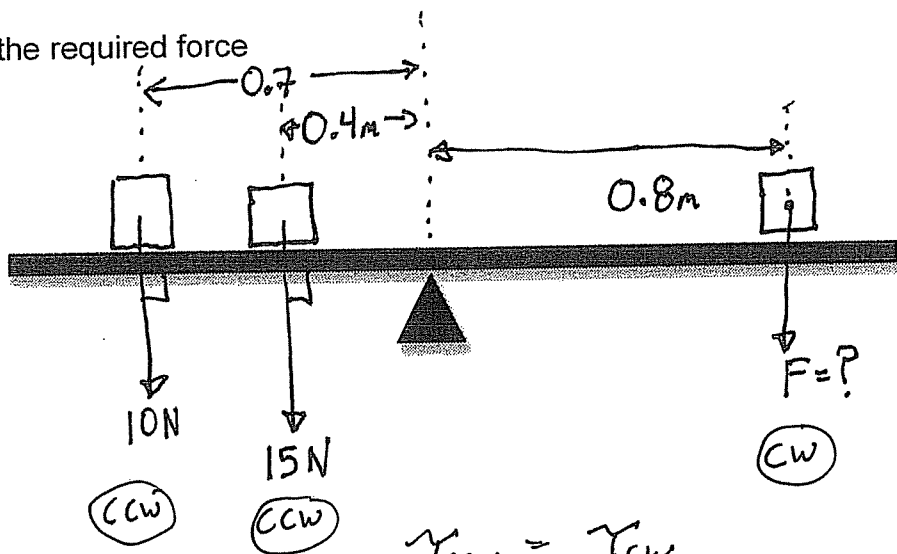
$$(400)(l) \sin 70^\circ + (39.2)(1.05) \sin 70^\circ = (150)(2.1)$$

$$(375.9)l = 276.3$$

$$l = 0.735 \text{ m}$$

Solutions

3. Find the required force

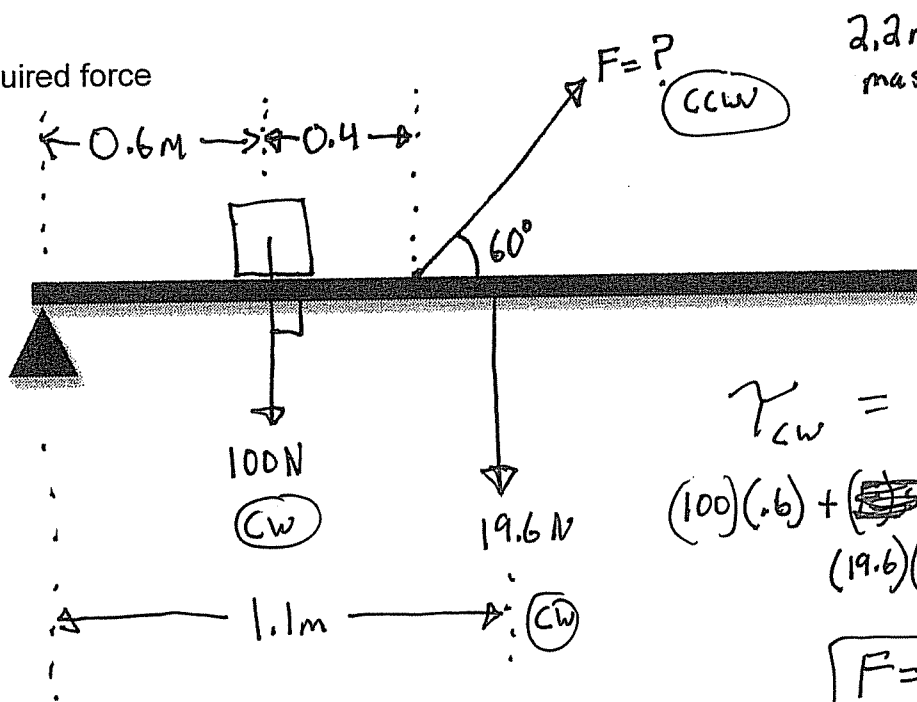


$$\tau_{ccw} = \tau_{cw}$$

$$(10)(0.7) + (15)(0.4) = (0.8) F$$

$F = 16.25 \text{ N}$

4. Find the required force



$$\tau_{cw} = \tau_{ccw}$$

$$(100)(.6) + (19.6)(1.1) = F(1)(\sin 60^\circ)$$

$F = 94.1 \text{ N}$