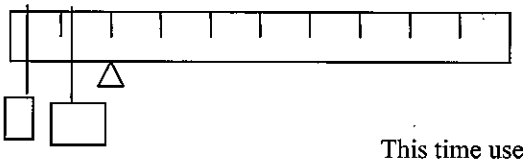
Name _____

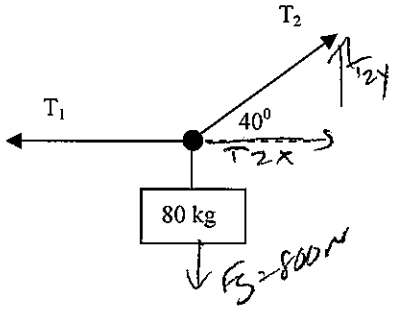
Set Up 2:



This time use two masses to balance your meter stick. The masses must be different and at least 20 grams. Record your data for masses and distances on the meter stick above. Then show that the torques balance. If they do not exactly balance, find the percent error.

Practice Problems

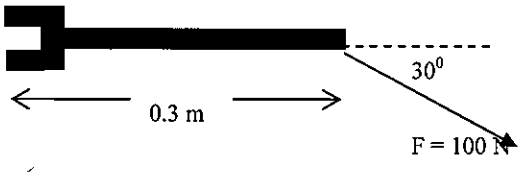
1. Find the tensions in the strings below…



x
$T_{2x} = T_1$
$T_2 \cos 40 = T_1$
$1244.6 \cos 40 = T_1$
$T_1 = 953.4N$

y
$T_{2y} = 800N$
$T_2 \sin 40 = 800$
$T_2 = 1244.6N$

2. Given the wrench below…



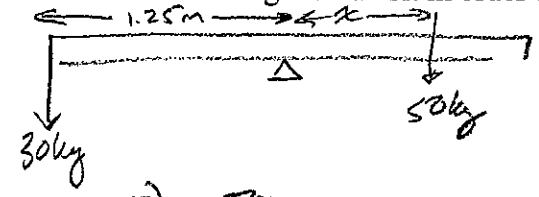
$\tau = Fr \sin\theta$
$= (100N)(.3m) \sin 30$
$\tau = 15 N \cdot m$

a. What is the torque on the wrench?
b. If the force was perpendicular to the wrench, how far from the end of the wrench would it have to be in order to produce the same torque?

$\tau = Fr \sin\theta$
$15 = 100r$
$r = 0.15m$

Name _____

3. A 30 kg child sits at one end of a 2.5 meter see-saw that is pivoted at its center. How far from the other end must a 50 kg woman sit in order to balance the see saw?

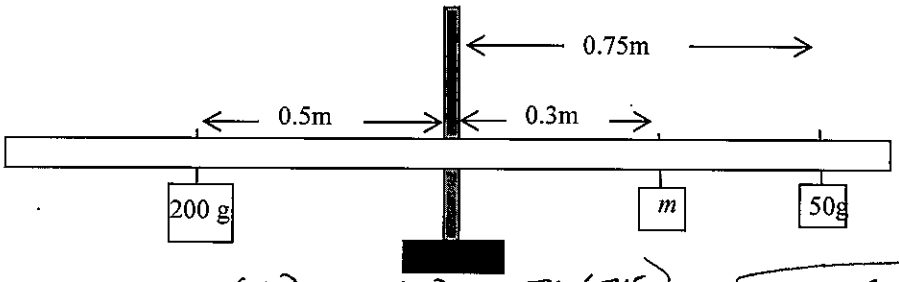


$30(1.25) = 50x$

$37.5 = 50x$

$0.75m = x$

4. Find the value of *m*.



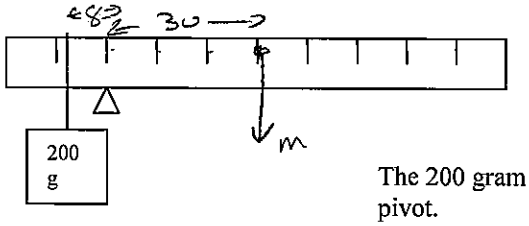
$200(.5) = m(.3) + 50(.75)$

$100 = .3m + 37.5$

$62.5 = .3m$

$m = 208.3g$

5. Find the mass of the meter stick…



The 200 gram mass is 8 cm from the pivot.

$200(8) = m(30)$

$1600 = 30m$

$53.3g = m$