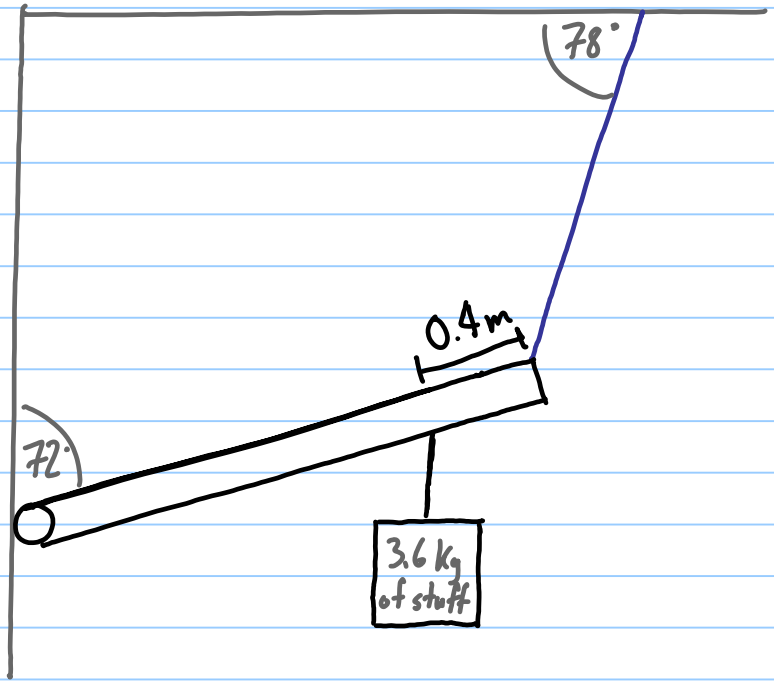
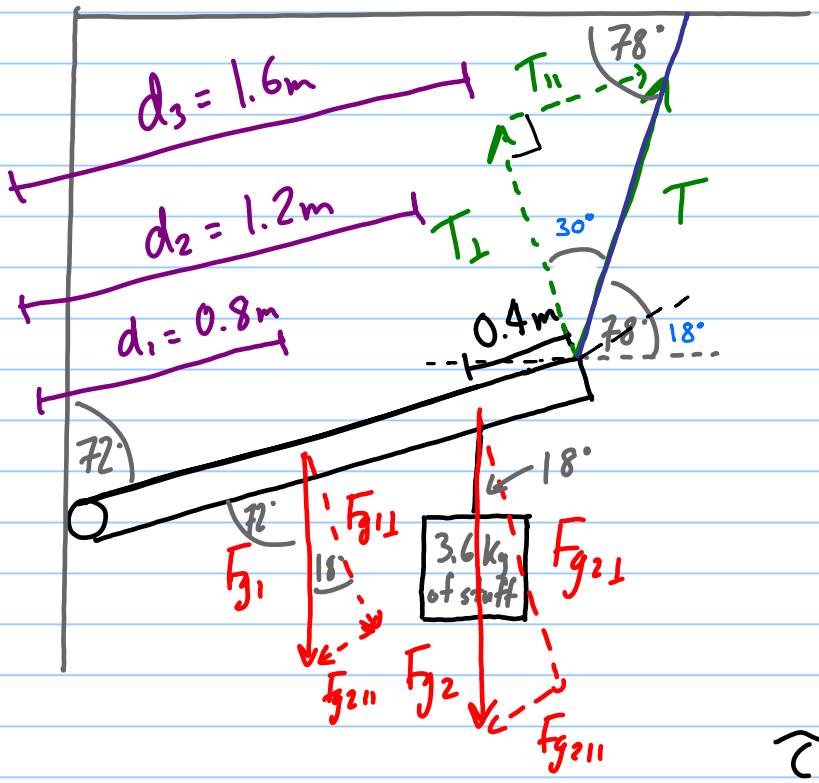
Quiz 4c

Note Title 08/11/2011

A 3.6 kg mass is hung from a uniform 1.6 m long 2.0 kg beam as shown. Find the tension in the cable.





$$F_{g1} = F_g \cos 18°$$
$$= mg \cos 18°$$
$$= (2.0)(9.8)\cos 18 = 18.64\,N$$

$$F_{g2} = F_g \cos 18°$$
$$= mg \cos 18 = 33.55\,N$$

$$\tau_c = \tau_{cc}$$

$$F_{g1\perp} d_1 + F_{g2\perp} d_2 = T_\perp d_3$$

$$T_\perp = \frac{F_{g1\perp} d_1 + F_{g2\perp} d_2}{d_3}$$

$$= \frac{(18.64N)(0.8m) + (33.55N)(1.2m)}{1.6m}$$

$$= 34.48\,N$$

$$T = \frac{T_\perp}{\cos 30°} = \frac{34.48\,N}{\cos 30°}$$

$$=$$

$$\boxed{39.81\,N}$$