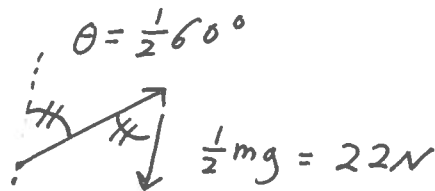
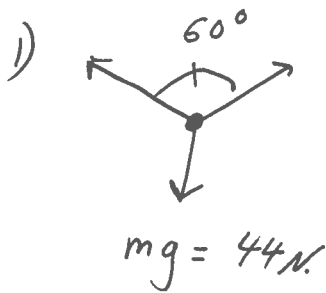


0310phys240 Wikiquiz: Force problems Part A

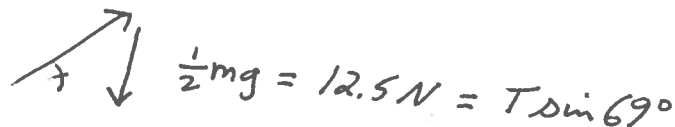
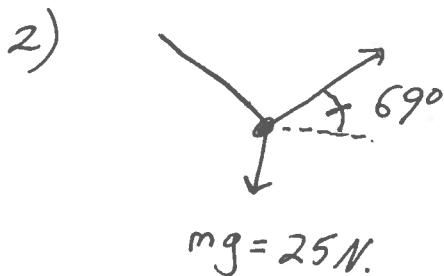


other string ~~also~~ also provides 22 N upward force.

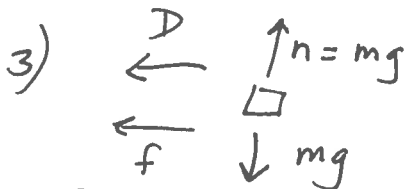
$$\frac{44}{2} = T \cos \frac{60^\circ}{2}$$

$$22 = T \cos 30^\circ$$

$$T = \frac{22}{\cos 30^\circ} = 25.4 \text{ N}$$



$$T = \frac{12.5}{\sin 69^\circ} = 13.39 \text{ N}$$



Given:

$$\mu = .37$$

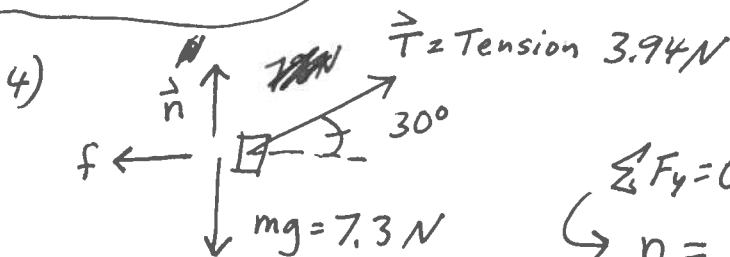
$$m = 4.5 \text{ kg}$$

$$D = 29 \text{ N}$$

$$ma = D + f = D + \mu mg$$

$$a = \frac{D}{m} + \mu g = \frac{29}{4.5} + .37(9.8)$$

$$a = 10.07 \text{ m/s}^2$$



2 unknowns: μ and f
 Need 2 equations.

$$\sum F_y = 0 = T \sin \theta + n - mg$$

$$\rightarrow n = mg - T \sin \theta$$

$$f = \mu n = \mu (mg - T \sin \theta)$$

$$\sum F_x = 0 \Rightarrow f = T \cos \theta$$

$$\rightarrow T \cos \theta = \mu (mg - T \sin \theta)$$

$$\mu = \frac{T \cos \theta}{mg - T \sin \theta} = \frac{3.94 \cos 30^\circ}{7.3 - 3.94 \sin 30^\circ} = 0.640 = \mu$$