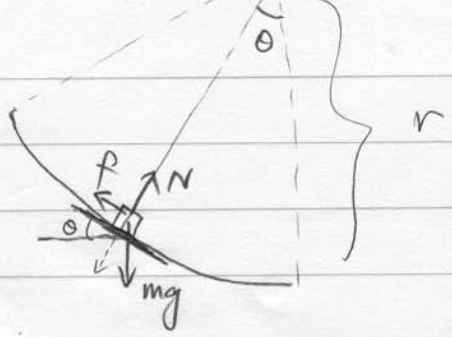
If we have a circular ramp.



$$N - mg\cos\theta = ma_r = m\frac{v^2}{r}$$

$$N - mg\cos\theta = m\frac{v^2}{r} \Rightarrow N = mg\cos\theta + m\frac{v^2}{r}$$

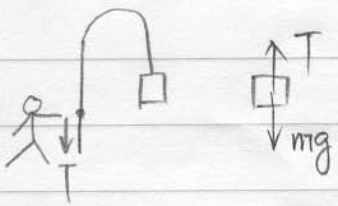
$$f = \mu(mg\cos\theta + mr\dot{\theta}^2)$$

$$dW = f\,ds = -\left(\mu(mg\cos\theta + m\frac{v^2}{r}\right) r\,d\theta$$

$$= -\mu mr\left(g\cos\theta + \frac{v^2}{r}\right)d\theta$$

here we can see dW depends on v and after integration we see W depends on the initial ~~v~~ velocity

(a)



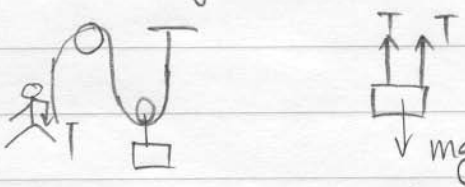
If the box moves with a constant speed. $a=0$. then

$$T - mg = 0$$

$$T = mg = 15 \times 9.8 = 147\ N$$

$$W = Ts = mgs = 15 \times 9.8 \times 2 = 294\ J$$

(b)



$$2T = mg \Rightarrow T = \frac{mg}{2} = 0.5 \times 15 \times 9.8 = 73.5N$$

$$W = \Delta E = T's' = T' \cdot 2s = \frac{T}{2} \cdot 2s = Ts = 294J$$

★ $s' = 2s$