Ex p146 #7, #3,4,8

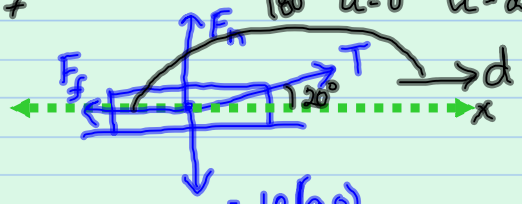
$W = F\cos\theta \cdot d$

F comp in direction of d

$W = F \cdot d$

$N \cdot m = J$ Joule

#7 180° $a = 0$ $d = 20m$ $\mu = .5$



$mg = 18(9.8)$

a) $T = ?$ $\Sigma F_x = -F_f + T\cos 20 = ma^{\,0}$ $F_f = \mu F_n$

$-.5F_n + .94T = 0$

$T = \frac{.5F_n}{.94}$ $T = \frac{.5(149.5)}{.94}$

$\Sigma F_y = F_n - mg + T\sin 20 = ma^{\,0}$ $T = 79.5N$

$F_n - 176.4 + .34T = 0$

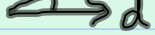
$F_n - 176.4 + .34\left(\frac{.5F_n}{.94}\right) = 0$

$F_n = 176.4 - .18F_n$

$1.18F_n = 176.4$

$F_n = \frac{176.4}{1.18} = 149.5N$

b) $W_T = T\cos\theta \cdot d$



$= 79.5\cos(20) \cdot 20$

$= 1494\,J$

c) $W_f = F_f\cos\theta \cdot d$ $\mu F_n = F_f$

$= 149.5(.5)\cos(180)\,20$ $.5(149.5) = 74.5N$

$a = 0$ $= -1494\,J$

mech. energy lost by friction same as $W_f = ?$

$W_n = F_n\cos\theta \cdot d$

$W_g = F_g\cos\theta \cdot d$

$W_f = -1495\,J$