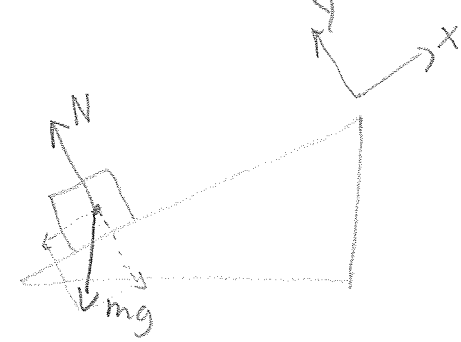
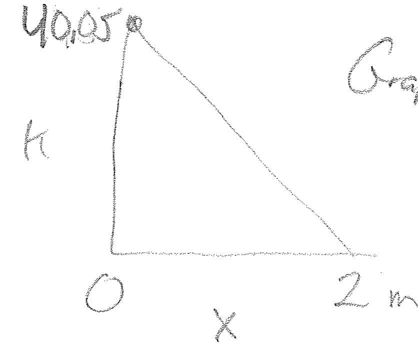
7-20 $V_0 = 4.00\,m/s$ $\mu_0 = 0$



$K_i = 40.0\,J$, over 2m of sliding, it loses all K (so stops)

What's N? Project the mg onto x (up ramp) and y (Normal to ramp),

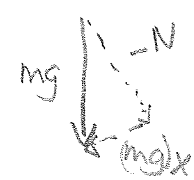
so $N = (mg)_y$, and $(mg)_x$ is what's pushing back down ramp to slow the box. over $\vec{d} = (2m)\hat{x}$, This force does



Graph of K:

$W = \vec{(mg)_x} \cdot \vec{d} = (40.0\,J)$ worth of work to slow box to a stop.

rather than figure out slope of ramp, let's look at The Triangle made of the forces;



Pythagoras says $(mg)^2 = (-N)^2 + (mg_x)^2$

so $N = \sqrt{(mg)^2 - (mg_x)^2}$

solve for $(mg_x) = \frac{W}{d} = \frac{40.0\,J}{2.0\,m} = 20\,N$

What's mg? we know $K_i = 40.0\,J = \frac{1}{2} m v_0^2$

or $m = \frac{2K_i}{v_0^2} = \frac{2\,(40.0\,J)}{(4.00\,m/s)^2} = 5.00\,kg$

so $N = \sqrt{(5.00\,kg)(9.8\,m/s^2) - (20\,N)^2}$

$= 44.7\,N$