HW due Monday p.221 #77, 79, 80, 81.

Work - Kinetic energy theorem.

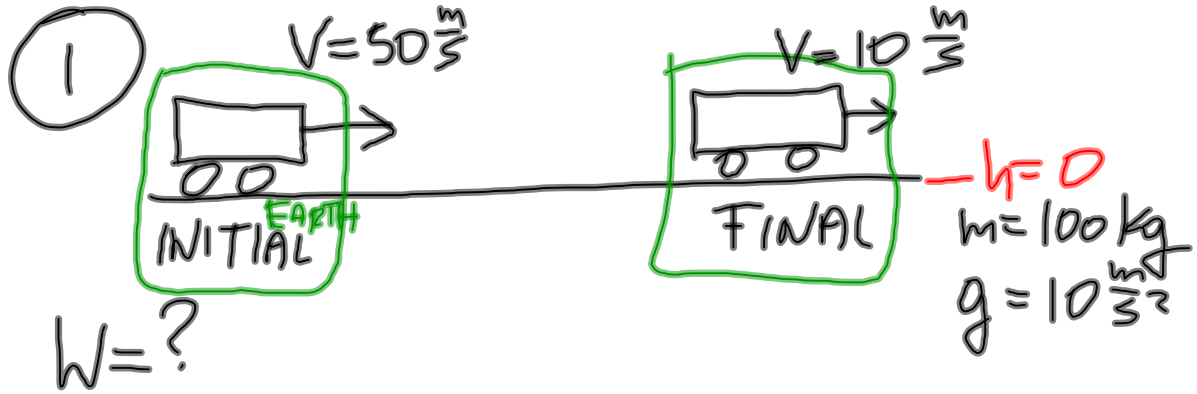
If the only energy involved in the process is kinetic energy, then the change in KE is equal to work done by the external forces.

$$KE_i + W_{NC} = KE_F$$

$$W_{NC} = KE_F - KE_i$$

$$W_{NC} = \Delta KE$$

Dec 19-10:27 AM



$$KE_i + W = KE_F$$

$$\frac{1}{2}(100)(50^2) + W = \frac{1}{2}(100)(10^2)$$

$$W = -1.2 \times 10^5 \text{ J}$$

Dec 22-9:52 AM

(2) $V = ?$ $70 \frac{m}{s}$ $m = 10\ kg$

$W = 5{,}000\ J$ (HAND ON CAR)

$KE_i + W = KE_F$

$\frac{1}{2}(10)V_i^2 + 5{,}000 = \frac{1}{2}(10)(70^2)$

$V_i = 62.4 \frac{m}{s}$

Dec 22-10:01 AM

3. Is it easier to speed up a 5 kg car by 10 m/s
a) from 0 to 10 m/s or
b) from 50 to 60 m/s?
c) why?

a) $W_a = \frac{1}{2}m(V_f^2 - V_i^2)$

$W_a = \frac{1}{2}(5)(10^2 - 0^2)$

$W_a = 250\ J$

Dec 22-10:07 AM

b) $W_b = \frac{1}{2}(5)(60^2 - 50^2)$

$W_b = 2{,}750\ J$

c) $W_b >> W_a$

KE formula is very sensitive to velocity (it is squared), so the greater the velocities the much greater the energies!

Dec 22-1:08 PM