HW Hints P. 126 Q5.3 & Ex 5.3

Q5.3 How would the answer for the final velocity change if it were raining?

$$W_{friction} = -F_f d = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$$

$F_f = \mu_k F_N$ ✡ μ_k on dry vs. wet pavement

Ref. Tables skid

Ex 5.3 A police investigator measures straight skid marks 27m long in an accident investigation. Assuming a friction force and car mass the same as the example given in 5.3, what was the minimum speed of the car when the brakes locked up?

✡ "Brakes locked up" → what does this mean?

f_k ⇓

✡ $F_f = 8\times10^3 N$, $m = 1000\ kg$ } from example 5.3

$d = 27m$, $v_f = 0\ m/s$, $v_i = ?$

Work done by Friction = change in KE of car

$$Work = F_f d = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$$

$F_f d$ = Work; $\frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$ = ΔKE

Caution

~~$\frac{1}{2}kx^2$~~

$$\Delta KE = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$$