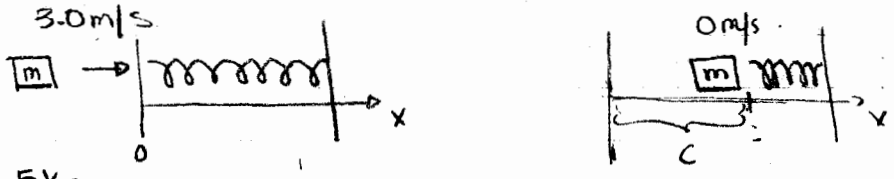
(Ch 11-2)



$m = 5\,kg$

a) $W_{net} = \Delta K$ ($\Delta K \to 0$)

$W^{fr} + W^{spring} = \Delta K$

i.e.

$$W^{spring} = \int_0^c -kx\,dx + \int_c^0 -kx\,dx = 0 \quad \text{(conservative force)}$$

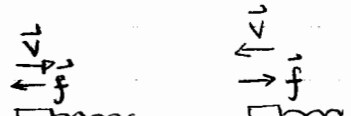
$$\therefore W^{fr} = \Delta K = \tfrac{1}{2}m(v_f^2 - v_i^2) = \tfrac{1}{2}(5\,kg)\left((2.2\,m/s)^2 - (3.0\,m/s)^2\right)$$

$$= -10.4\,J \;//$$

b). $W^{fr} = -\mu F_N (c-0) + \mu F_N (0-c)$

$= -2\mu F_N c$

$= -2\mu mg c$



$$c = \frac{W^{fr}}{-2\mu mg} = \frac{-10.4\,J}{-2(5.0kg)(0.3)(9.8\,m/s^2)}$$

$= 0.35\,m$ //