P #13

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a) $m = 70.0\ kg$
$v_i = 4.0\ m/s$
$v_f = 0\ m/s$

$KE_1 + W = KE_2$

$\frac{1}{2}(70.0\ kg)(4.0\ m/s)^2 + W = \frac{1}{2}(70.0\ kg)(0\ m/s)^2$ 0

$\boxed{W = -560\ J}$ (energy lost)

b) $\mu = .70$
$W = \Delta KE = -560\ J$
$m = 70\ kg$

$F_f = \mu \cdot N$
$= (.70)(70\ kg)(9.8\ m/s^2)$
$= -480.2\ N$ (negative for against motion)

$W = F_f \cdot d$
$-560\ J = (-480.2\ N) \cdot d$

$\boxed{d = 1.2\ m}$