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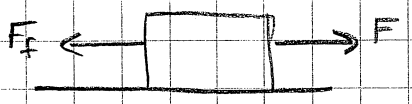
(1) $W = Fs\cos\theta$

$= mgs = (256\ kg)(9.81\ ms^{-2})(2.80\ m) = \underline{7030\ J}$

(2) $W = Fs\cos\theta$

$= mgs = (65\ kg)(9.81\ ms^{-2})(20.0\ m) = \underline{12\,800\ J}$

(3)



(a) constant velocity, so $a = 0$

$\Sigma F = 0$

$F - f_f = 0$

$F = f_f = 230N$

$W = Fs\cos\theta = (230N)(4.0m) = \underline{920\ J}$

(b) $\Sigma F = 0$

$F_{lift} = f_g$

$W = fs\cos\theta = (1300\ N)(4.0\ m) = \underline{5200\ J}$

(4) $F_f = \mu F_N = (0.50)(160\ kg)(9.81\ ms^{-2}) = 785\ N$

Constant velocity, $a = 0$, $\Sigma F = 0$

therefore $F_{movers} = F_{friction}$

$W = Fs\cos\theta$

$= (785\ N)(10.3\ m)$

$= \underline{8100\ J}$

⑤ $W = Fs\cos\theta$

$a = 2.0\,ms^{-2}$
$t = 7.0\,s$
$u = 0$
$m = 5.0\,kg$

$F = ma$
$F = (5kg)(2\,ms^{-2})$
$F = 10.\,N$

$s = ut + \frac{1}{2}at^2$
$= \frac{1}{2}(2.0\,ms^{-2})(7s)^2$
$s = 49\,m$

$W = Fs = (10.N)(49\,m) = \underline{490\,J}$

⑥ Book 1 : no work (it starts the pile)
Book 2 : raised 0.043 m
Book 3 : raised 0.043 m × 2 = 0.086 m
⋮
Book 8 : raised 0.043 m × 7

So...

$\sum W = W_1 + W_2 + W_3 \cdots W_8$
$= Fs_1 + Fs_2 + \cdots Fs_8$
$= F(s_1 + s_2 + s_3 \cdots s_8)$ $\quad s_1 = 0$
$= F[.043m + (0.043m)2 + (0.043)3 + \cdots + (0.043)7]$
$= F(.043m)(1+2+3+4+5+6+7)$
$= mg(.043m)(28)$
$= (1.7kg)(9.81\,ms^{-2})(.043\,m)(28)$
$W = \underline{20.\,J}$

⑫ (a) $W = \text{Area}$
$= \frac{(400)(3)}{2} + (400)(4) + \frac{400(3)}{2}$
$= 2800\,J$

(b) $W = \text{Area}$
$= \frac{(-200)(2)}{2} + (-200)(1.5) + \frac{(-200)(1.5)}{2} = -650\,J$
$W = 2800J - 650J = \underline{2150\,J}$