Exercise 8B

(4) $P = \frac{W}{t} = \frac{2000(10)75}{4.5} = 33,3 \text{ kW}$

(3) $\frac{1}{2}mu^2 + W = \frac{1}{2}mv^2$

$\therefore W - mgh = \frac{1}{2}mv^2$

$\therefore W = \frac{1}{2}30(2)^2 + 30(10)3$

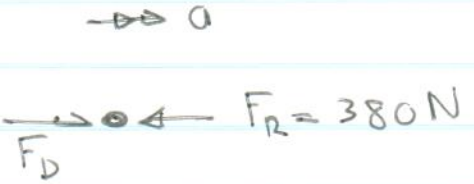
$\therefore W = 960 \text{ J}$

$P = \frac{W}{t} = 160 \text{ W}$

Miscellaneous Exercise 8

(6) $m = 1000\ kg$

$P = F_D . v$



b) $\Sigma F = ma$

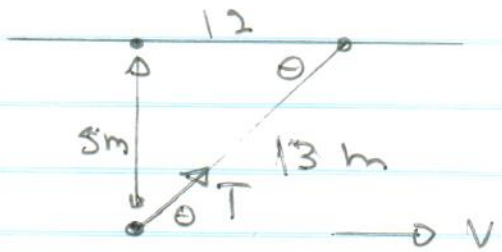
$\therefore F_D - 380 = 1000(0.7)$

$\therefore F_D = 1080\ N$

$\therefore P = F.v = 1080(12) = 12960W \approx 13kW$

(7.) $v = 0{,}78\ m\,s^{-1}$

$T = 400\ N$



$W = T\cos\theta \cdot s$

$\therefore W = \left[400 \frac{12}{13}.\right] \left(0{,}78(10 \cdot 60)\right)$

$\therefore W = 172800\ J = 173\ kJ$

Exercise 9A

(8) $P = \frac{W}{t} \Rightarrow W = 2000(7)$ (Work by engine)

$\therefore \frac{1}{2}mv_1^2 - mgh + W = \frac{1}{2}mv_2^2$

Constant speed $\Rightarrow v_1 = v_2$

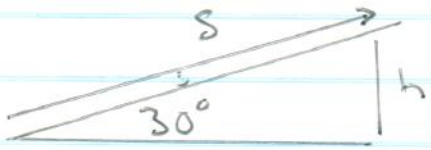
$\therefore W = mgh$

$\therefore 2000(7) = 160(10)h$

$\therefore h = 8,75 \text{ m}$

Exercise 9A

(13) Smooth ramp



$(E_K)_1 + (E_P)_1 = (E_K)_2 + (E_K)_2$

$\frac{1}{2} m 4^2 + 0 = \frac{1}{2} m 1,2^2 + m(10) h$

$\therefore \frac{1}{2} 4^2 = \frac{1}{2} 1,2^2 + 10 s. \sin 30°$

$\therefore \quad s = 1,46 m$