

Exercise 8 B

$$(1) P = \frac{W}{t} = \frac{2000(10)75}{45} = 33,3 \text{ kW}$$

$$(3) \frac{1}{2} m u^2 + W = \frac{1}{2} m v^2$$

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

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

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

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

Miscellaneous Exercise 8

$$(c) \quad m = 1000 \text{ kg}$$

$$P = F_D \cdot v$$

$$\rightarrow \rightarrow 0$$



A free-body diagram of a particle represented by a small circle. A horizontal arrow labeled F_D points to the right from the left side of the circle. A horizontal arrow labeled $F_R = 380 \text{ N}$ points to the left from the right side of the circle.

$$\rightarrow \rightarrow \sum F = m a$$

$$\therefore F_D - 380 = 1000(0,7)$$

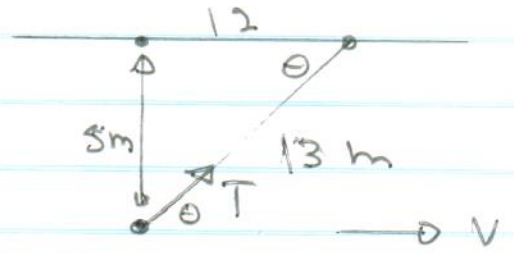
$$\therefore F_D = 1080 \text{ N}$$

$$\therefore P = F \cdot v = 1080(12) = 12960 \text{ W} \approx 13 \text{ kW}$$

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

$$T = 400 \text{ N}$$

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



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

$$\therefore W = 172800 \text{ J} = 173 \text{ kJ}$$

Exercise 9A

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

$$\therefore \frac{1}{2} m v_1^2 - mgh + W = \frac{1}{2} m v_2^2$$

$$\text{Constant speed} \Rightarrow v_1 = v_2$$

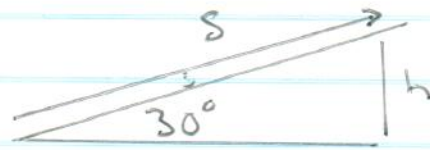
$$\therefore W = mgh$$

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

$$\therefore h = 8.75 \text{ m}$$

Exercise 9A

(13) Smooth ramp



$$(E_k)_1 + (E_p)_1 = (E_k)_2 + (E_p)_2$$

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

$$\therefore \frac{1}{2} v^2 = \frac{1}{2} 1,2^2 + 10 s \cdot \sin 30^\circ$$

$$\therefore s = 1,46 \text{ m}$$