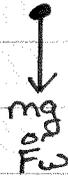


① Given:

$W = 1.15 \times 10^5 \text{ J}$
 $m = 60.0 \text{ kg}$
 $D = ?$

Soln:



$W = FD$

$F = mg$

$W = mgD$

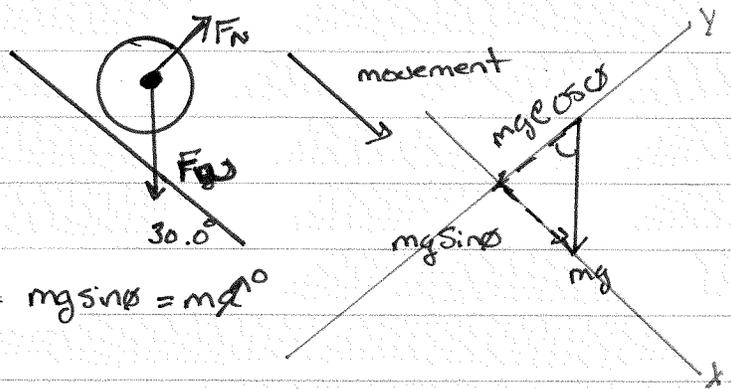
$D = \frac{W}{mg} = \frac{1.15 \times 10^5 \text{ J}}{(60.0 \text{ kg})(9.8 \text{ m/s}^2)}$

$D = 196 \text{ m}$

② Given:

$W = 5.30 \times 10^4 \text{ J}$
 $m = 5.40 \times 10^2 \text{ kg}$
 $D = ?$

Soln:



$W = FD$

$\sum F_x = mg \sin \theta = m a^{\uparrow 0}$

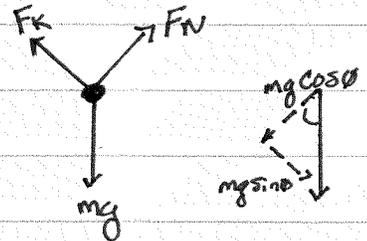
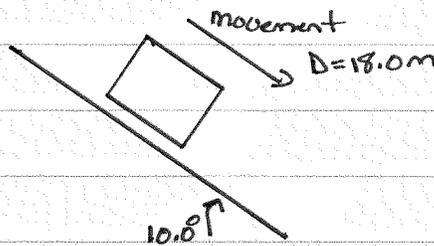
$W = mg \sin \theta D$

$D = \frac{W}{mg \sin \theta} = \frac{5.30 \times 10^4 \text{ J}}{(5.40 \times 10^2 \text{ kg})(9.8 \text{ m/s}^2) \sin 30.0^\circ}$

$D = 19.0 \text{ m}$

③ Given:

$m = 1.02 \times 10^3 \text{ kg}$
 $\mu_k = 0.13$
 $W = ?$



$W = FD$

$W = mg (\sin \theta - \mu_k \cos \theta) D$

$\sum F_x = mg \sin \theta - F_k = m a^{\uparrow 0}$

$\sum F_y = F_N - mg \cos \theta = m a^{\uparrow 0}$

$F_k = \mu_k F_N$

$F_N = mg \cos \theta$

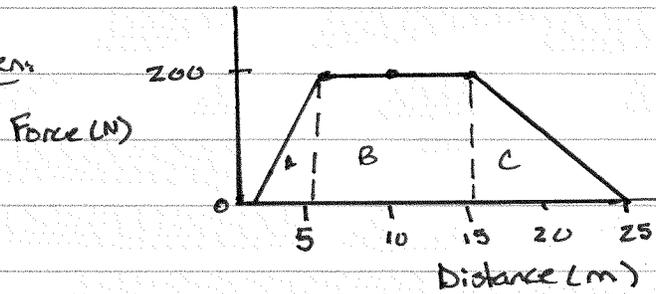
$\sum F_x = mg \sin \theta - \mu_k mg \cos \theta$
 $= mg (\sin \theta - \mu_k \cos \theta)$

③ Cont:

$$W = (1.02 \times 10^3 \text{ kg}) \times 9.8 \text{ m/s}^2 (18.0 \text{ m}) [\sin 10^\circ - 0.13 \cos 10^\circ]$$

$$W = 8210 \text{ J}$$

④ Given:



Soln.

$$\text{Work} = \text{Area under } F-d \text{ Graph}$$

$$= \text{Area A} + \text{Area B} + \text{Area C}$$

$$= \frac{1}{2} (5 \text{ m}) (200 \text{ N}) + (10 \text{ m}) (200 \text{ N}) + \frac{1}{2} (10 \text{ m}) (200 \text{ N})$$

$$\text{Work} = 3500 \text{ J}$$