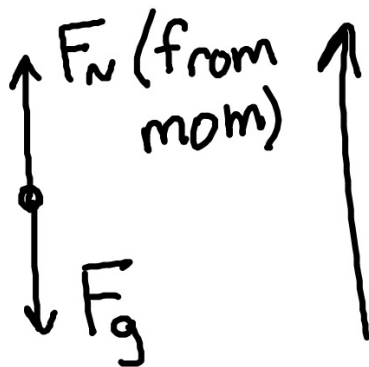


Bellwork How much work is done to push a 150kg box across a frictionless surface if you apply a force of 20N over a distance of 1m? What if there was a frictional force of 10N?

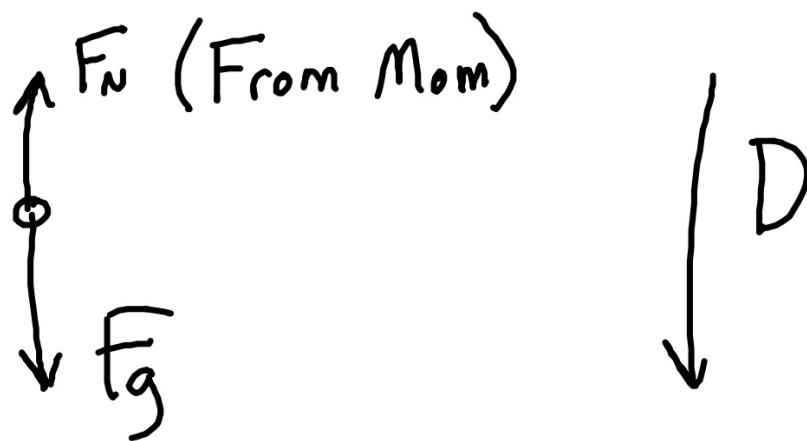
Review of Homework Problems

FBD (Baby)

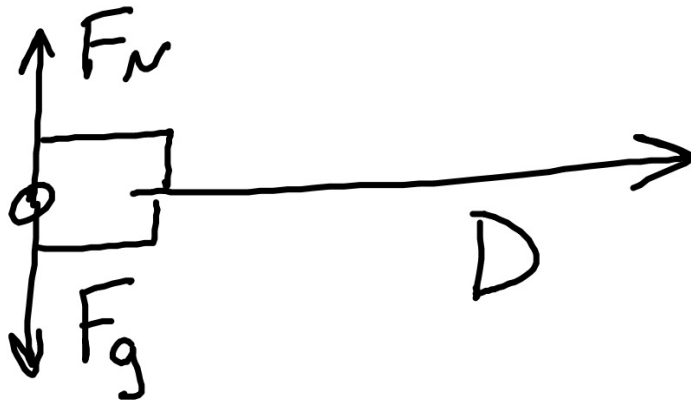


D (up)

$F_N \uparrow, D \uparrow$
 $\oplus$ work



$F_N \uparrow, \downarrow D$
mom does -work



$$F_N \perp D$$

mom does no work

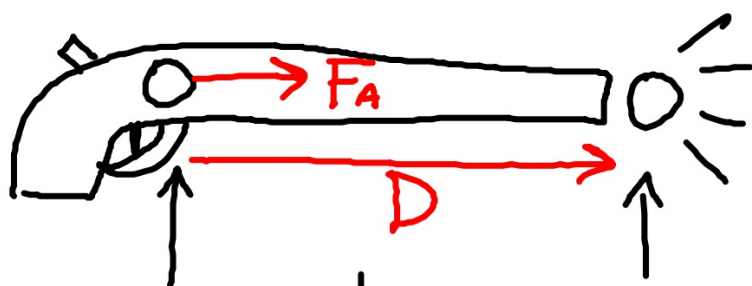
$$K = \frac{1}{2}mv^2$$

3) 650,275 J

4) a) 211,750 J, 847,000 J
b) 635,250 J

4b) $W = K_f - K_i$

$$W = 847,000\text{J} - 211,750\text{J}$$



at rest
 $0 \text{ m/s} = V_i$
 $K_i = 0 \text{ J}$

$K_f = ?$

$$K_f = \frac{1}{2} m V_f^2 = 1956 \text{ J}$$

$$m = 0.0042 \text{ Kg}$$

$$V_f = 965 \frac{\text{m}}{\text{s}}$$

$$W = ?$$

$$W = \pm FD$$

or

$$W = K_f - K_i$$

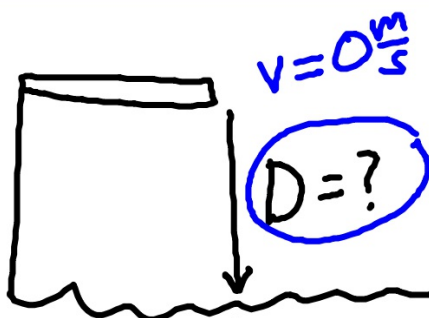
$$1956 \text{ J} = F(0.75 \text{ m})$$

$$F = 2608 \text{ N}$$

$$W = 1956 \text{ J} - 0 \text{ J}$$

$$W = 1956 \text{ J}$$

6



$$m = 50 \text{ kg}$$

$$\downarrow F_g = 490 \text{ N}$$

$$W_w = -5200 \text{ J}$$

$$W_g = +1960 \text{ J}$$

$$D = 4.0 \text{ m}$$

$$\uparrow F_w = 1300 \text{ N}$$

$$\downarrow F_g = 490 \text{ N}$$

Total work =

$$\boxed{-3240 \text{ J}}$$

b) what $K_i = ?$

$$W = K_f - K_i$$

$$K = \frac{1}{2} m v^2$$

$$\bullet K_f = 0$$

$$-3240 \text{ J} = 0 - K_i$$

$$+3240 \text{ J} = +K_i$$

c) $K_i = 0$

$D = ?$

$\downarrow F_g = 490 \text{ N}$

$K_f = 3240 \text{ J}$

$W = K_f - K_i$

$W = 3240 \text{ J}$

$(490 \text{ N})D = 3240 \text{ J}$

$W = FD$

$D = 6.61 \text{ m}$