WORK AND ENERGY

FT WORK AND ENERGY (21)

Directions: Solve the following problems. Your work will be graded, not just the answer.

1) What is the weight of an 8kg object?
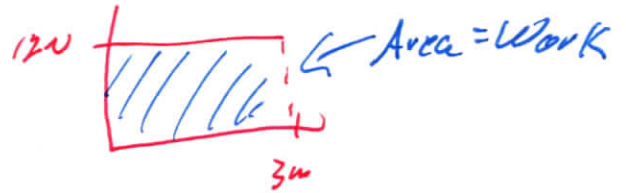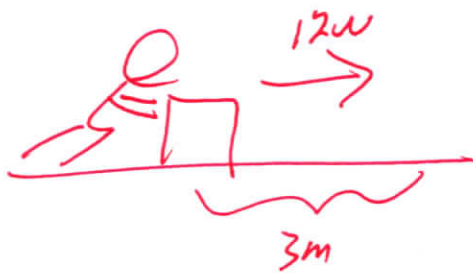
$$W = mg$$

$$W = (8 kg)(9.8 m/s^2)$$

$$W = 78.4 N$$

2) A 12N force is applied to push a box a distance of 3 m in a time of 15 seconds. How much work is done?

$$W = Fx = (12N)(3m) = 36 J$$

3) Determine the work done lifting an 8kg object to a height of 3 m in a time of 15 seconds.

$$W = PE = mgh$$

$$W = (8 kg)(9.8 \text{ m/s}^2)(3 m)$$
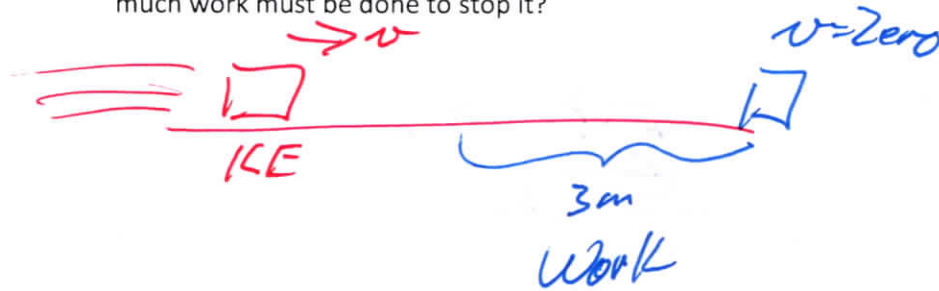
$$W = 235 \text{ J}$$

4) Determine the power done lifting an 8kg object to a height of 3 m in a time of 15 seconds.

$3m$ $t = 15s$
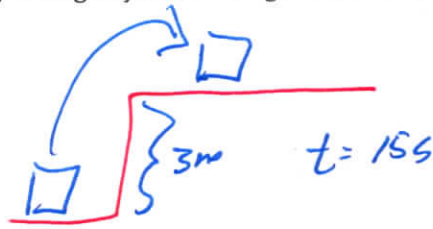
$$Power = \frac{Work}{time} \frac{PE}{t} = \frac{mgh}{t} = \frac{(8kg)(9.8\,m/s^2)(3m)}{(15s)} = 15.7\ Watts$$

key Level II Physics Pd 2

5) A 12 kg object is moving at 5m/s. The box comes to a complete stop in a distance of 3 m. How
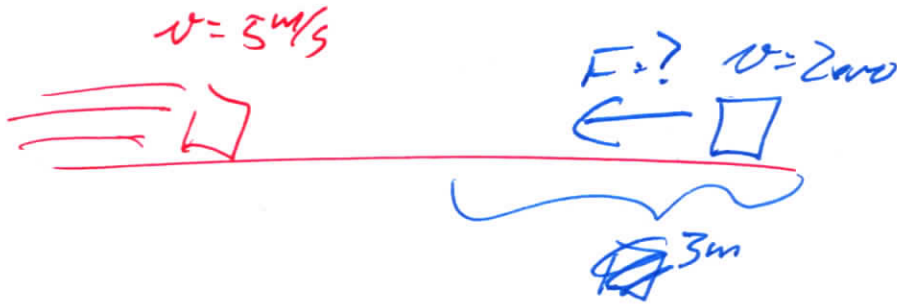much work must be done to stop it?

$KE = Work$

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

$\left(\frac{1}{2}\right)(12\,kg)(5\,m/s)^2 = Work$

$150\,J = Work$

6) A 12 kg object is moving at 5m/s. The box comes to a complete stop in a distance of 3 m. What force must be applied to stop it?
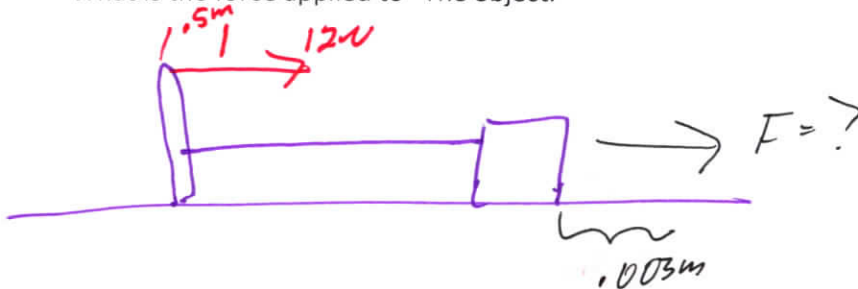
$v = 5 \text{m/s}$

$F = ?$ $v = Zero$

3m

$KE = W$

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

$\frac{\frac{1}{2}mv^2}{x} = F$

$\frac{mv^2}{2x} = F$

$\frac{(12kg)(5\text{m/s})^2}{(2)(3m)} = \boxed{50N}$

7) A simple machine is used to move an "object" such as a person applies a 12N force to move a lever a distance of 0.5m. This motion causes another object to move a distance of 0.003m. What is the force applied to "The object."

Work = Work

$\bar{F}x = Fx$

$\dfrac{\bar{F}x}{x} = F$

$\dfrac{(12N)(.5m)}{.003m} = \boxed{2000 N}$

8) What is the mass of an 8kg object?

8kg