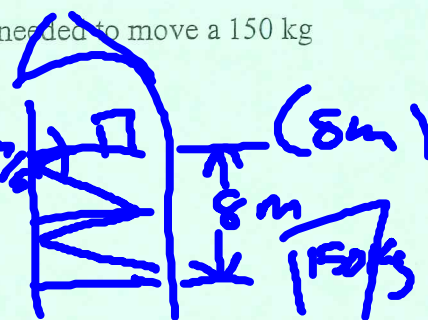


# WORK-ENERGY PROBLEM WORKSHEET

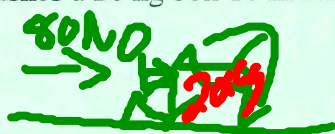
- 2d 1. The third floor of a house is 8 m above street level. How much work is needed to move a 150 kg refrigerator to the third floor?

$$W = F \Delta s = W \Delta s = m g \Delta s = (150 \text{ kg}) (9.8 \text{ m/s}^2) (8 \text{ m})$$

2. If Stan does 176 J of work lifting himself 0.30 m, what is Stan's mass?



- 1st 3. Lee pushes a 20 kg box 10 m across the floor with a horizontal force of 80 N. How much work does Lee do?



$$W = F \Delta s = (80 \text{ N}) (10 \text{ m}) = 800 \text{ Nm} = 800 \text{ J}$$

4. Sau-Lan, with a mass of 52 kg, rides the up escalator at Ocean Park in Hong Kong, the world's longest. If the escalator has a length of 227 m and angle of  $31^\circ$ , calculate the work done by the escalator to lift Sau-Lan.

5. A librarian lifts a 2.2 kg book from the floor to a height of 1.25 m, carries the book 8.0 m to the stacks, and places the book on a shelf 0.35 m above the floor. How much work is done on the book?

6. A horizontal force of 805 N is needed to drag a crate across the floor with a constant speed. If the rope used to drag the crate makes an angle of  $32^\circ$  with the floor:

- a. Calculate the force applied along the rope.

$$\cos 32^\circ = \frac{805 \text{ N}}{F} \quad \text{so } F = \frac{805 \text{ N}}{\cos 32^\circ} = ?$$

- b. Calculate the work done to pull the crate a distance of 22m.

$$W = F \Delta s = (805 \text{ N}) (22 \text{ m}) = ?$$

- c. If the job is done in 8 seconds, how much power is developed?

$$P = \frac{W}{\Delta t} = \frac{?}{8 \text{ s}} = ? \text{ J/s} = ? \text{ W}$$

7. Mary weighs 505 N. If she walks down a flight of stairs to a level 5.5 m below, what is the change in her potential energy?

8. Toni has a mass of 45 kg and is moving with a speed of 10 m/s.

- a. Calculate her kinetic energy.

- b. If Toni's speed changes to 5 m/s, what is her kinetic energy? Compare to part a answer.

