Work and Kinetic Energy

"Change in kinetic energy is equal to the mechanical work done by all forces"

$$\Delta K = W$$

(Work = Force x Displacement)

$K = \frac{mv^2}{2}$, is called Kinetic Energy of an object

$W = F\Delta x$, is called Mechanical Work

Homework 15

Problem 1.

Boeing-737 with thrust force 40 kN (kiloNewtons) is going from New York City to Chicago, which is a 1100 km trip. Boeing-747 with thrust force 280 kN is going from NYC to London, which is 5500 km trip. How many times more fuel does 747 require for its trip?

Hint: the amount of fuel is proportional to work done by the engines.

Problem 2.

How much work has to be done to accelerate a car from speed 0 m/s to 30 m/s? Mass of the car is 2000 kg.