Work and Kinetic Energy

Starting with the 2nd Newton's Law:

$$F = ma$$

One can derive another important result:

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

$$\Delta K = W$$

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

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

(Work = Force x Displacement)

Homework

Problem 1. How much work has to be done to accelerate a car from speed 0m/s to 30 m/s? Mass of the car is 2000kg.

Problem 2. A driver in the car from Problem 1 applies breaks. Friction force acting on the car is 10kN. Find the distance that the car will travel before coming to a complete stop (its speed was 30m/s).