A box is subject to a force the is defined as $F(x) = (10x)$ N. How much work is done on the box if this force is applied on the box as it move 10 m in the direction of the force?

A gun fires a shell straight up with a initially velocity of 1000 m/s. How high does the shell reach above the gun?

Suppose you have a mass of 80 kg and are riding a 10 kg bicycle up a steep mountain. Ignoring friction forces and air resistance, it takes you 1 hour to climb a 2000 m mountain. How much power do you have to generate to make this possible?

Given a potential of the form $U = x^2 - x^3$, find the associated force and the equilibrium points. State if these points are stable or unstable.