Momentum and Springs

1. A spring of constant 1000N/m is placed between two trollies of mass 0.5kg.

The spring is compressed by 5cm and the trollies are released.

What speed to the two trollies move off at?

(Assume all the spring energy is transferred to the trollies, and they move without friction.)

2. One of the trollies then hits a spring buffer and rebounds elastically.
The spring has constant 2000N/m.
a) Describe the energy transfers that take place.

b) What is the spring's maximum compression?

c) What is the maximum force that the spring exerts on the trolley?

d) Sketch a graph of force vs distance for the trolley from the point that it comes in contact with the spring to the point that it leaves the spring.

e) Sketch a graph of force vs time for the situation in d).