Module 08-Lesson 4

Elastic Potential Energy

Question 1: How far would you have to stretch a spring with $k = 1.5$ kN/m for it to store 240 J of energy?

Question 2: Tendons are strong elastic fibers that attach muscles to bones. During a physiological test on a particular tendon, it was found that when a 250 g object was hung from it, the tendon stretched by 1.23 cm. Find the force constant of this tendon in N/m and the energy stored in the tendon, assuming that it obeys Hooke's law.

Problem: The spring in Fig. 1 has an elastic constant $100 \,\mathrm{kN/m}$. A 500-g cart is placed against the spring, which is then compressed 10 cm. When the block is released, how high up the curved track does the cart rise? Assume friction is negligible.
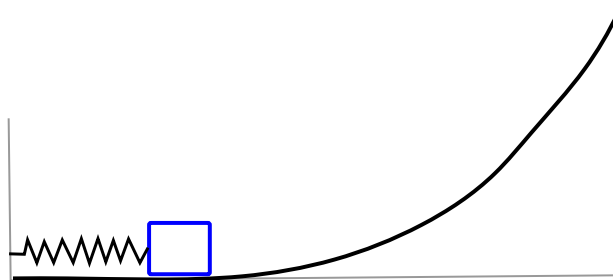

FIG. 1: Cart launch by spring compression