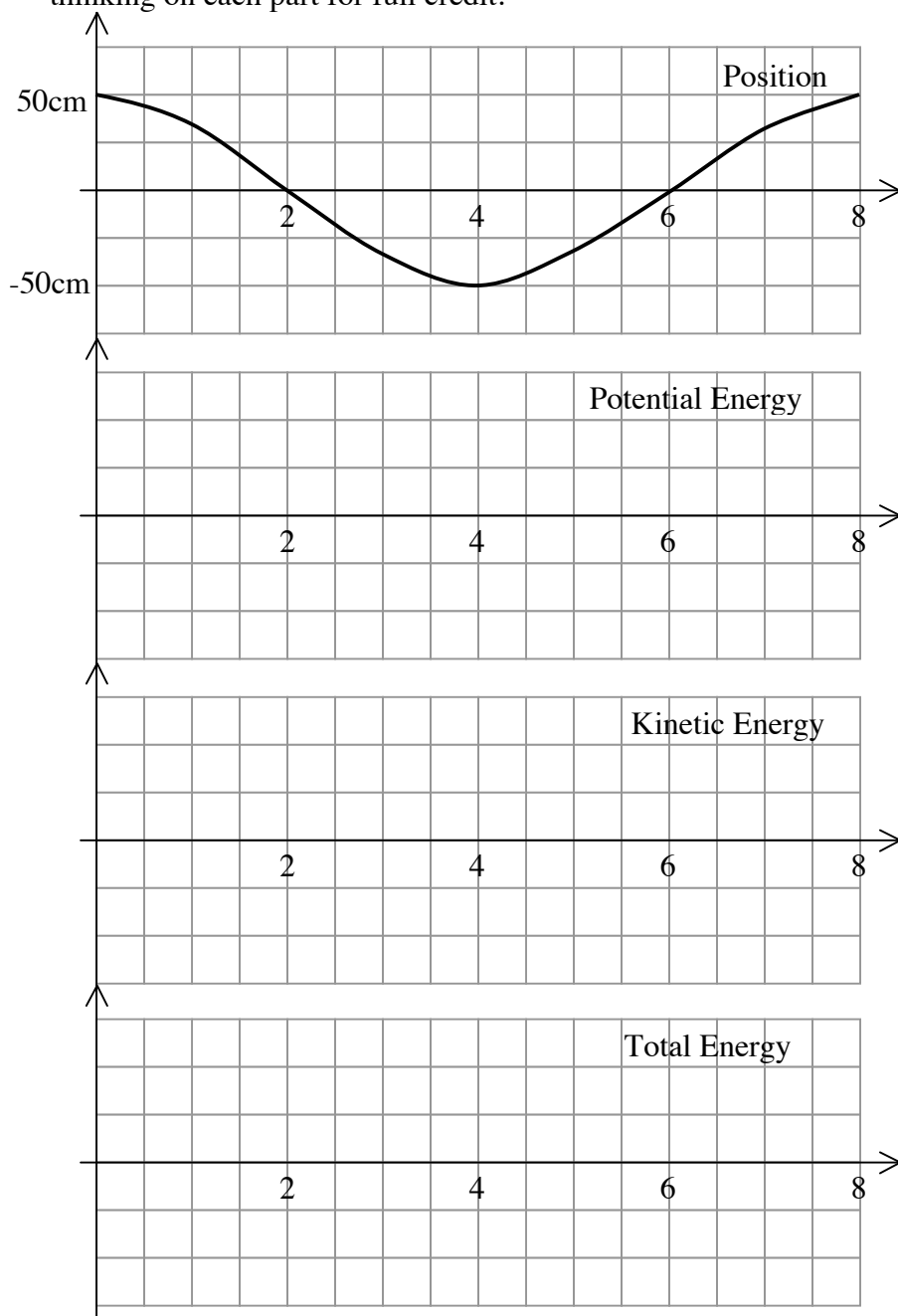
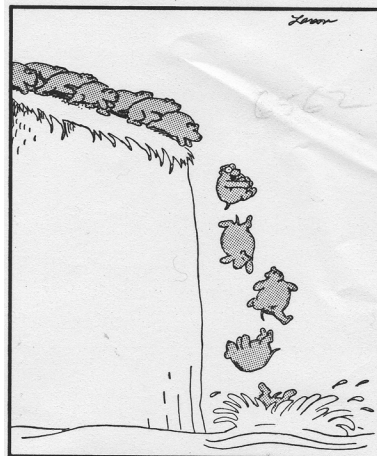


1. The lemmings shown at the right leave the top of a 4.00m high cliff with a speed of 3.00m/s at an angle of  $70.0^\circ$  below horizontal. Find the speed at which they hit the water.

2. A 0.800kg mass oscillates horizontally at the end of spring with a spring constant of 2.00N/m. The graph of its position versus time is shown below. Sketch the graph of the system's (a) potential energy versus time, (b) kinetic energy versus time, and (c) total energy versus time. Be sure to label the maximum value on vertical axis of each graph. Be sure to your explain your thinking on each part for full credit.



3. A 60.0kg bungee jumper steps off a 55.0m high bridge. The unstretched length of the cord is 30.0m and it stretches an additional 20.0m when the jumper is at the lowest point. Find the spring constant of the cord assuming air resistance is negligible and the cord is massless.

4. The 52.0kg woman pictured at the right falls into the safety net and stretches it 0.500m. The net springs back and she flies through the third story window 9.00m above the net at a speed of 13.0m/s. Find (a) the height of the window she fell from and (b) the effective spring constant of the safety net.

