Physics 200 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Spring Practice Problem

The diagram below shows a sequence of events through which a box is launched by one spring, slowed down by friction, and brought to rest by another spring. In the top frame, the box is at rest. In the second frame, showing the box at position A, the launching spring is compressed and ready for launch. At position B, the box is sliding rightward after having been pushed by the left spring. At position C, the box has just been stopped by the compression of the spring on the right. For the left spring, k=60N/m. For the right spring, k=50N/m The mass of the block is 4kg. *[Both springs are 100% efficient, and this entire sequence takes place in a vacuum.]*

1. When the box is at position A…
   1. How much force is being applied to the left spring?
   2. How much energy is stored in the left spring?
2. When the box is at position C…
   1. How much force is being applied to the right spring?
   2. How much energy is stored in the right spring?
3. Assuming that this takes place in a vacuum, and that the springs are 100% efficient, there must have been friction between the floor and the block. Regarding this friction…
   1. How can you tell the friction exists?
   2. Over what distance did friction do its work?
   3. What was the force of friction that acted on the block?
4. When the box is at position B…
   1. How much kinetic energy does the box have?
   2. What is the velocity of the block at position B?

