Keystone: Chapter 8

You hang by your hands from a tree limb that is a height L above the ground, with your center of mass a height h above the ground, and your feet a height d above the ground. You then let yourself fall. You absorb the shock by bending your knees, ending up momentarily at rest in a crouched position with your center of mass a height b above the ground. Your mass is M. You will need to draw labeled physics diagrams for the various stages in the process.

1) What is the net internal energy change ΔE_{int} in your body (chemical plus thermal)?

2) What is your speed v at the instant when your feet first touch the ground?

3) What is the approximate average force F exerted by the ground on your feet during the time when your knees are bending?

4) How much work is done by this force F?