3. Tyrannosaur (T. Rex) ***(6 points)*** Paleontologists have discovered tracks of a tyrannosaur where the footprints of the same leg are $A = 4.0$ meters apart. They have also recovered a piece of a tyrannosaur leg bone that has bone cross-sectionalo area $N = 10000$ times that of a chicken (which the tyrannosaur is related to).

i) (3 pt) Knowing that the chicken leg is approximately $l = 15\,\text{cm}$ tall, estimate the length of a tyrannosaur leg L. You may assume that the length of a leg scales as the length of the whole animal, and that the bone stress (force per area) is the same for both animals. Is your result consistent with the step length A?

ii) (3 pt) Estimate the natural walking speed of the tyrannosaur by approximating the walking motion of a leg with a freely oscillating pendulum motion. State clearly all the assumptions you make.