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Physics 2C, Winter 2020

Reading Assignment due Friday 1/31: Submit via Gradescope by 8:00am

1. Your water bottle is full of water at room temperature. You want the water to be 1.00 K warmer. Instead of heating it up in the microwave, you decide to drop it from a 1 m height multiple times, reasoning that most of the gravitational potential energy eventually goes to heating up the water (PE $\rightarrow$ KE just before hitting the ground $\rightarrow$ a change in internal energy of the water in the water bottle). Assuming all of this energy goes into heating up the water, how many times do you have to drop the water bottle from a 1 m height to warm it up the required amount?

2. First read example 19.6. This problem has the same setup, except we will replace "ethyl alcohol" with "water."

   (a) First, without any calculation, guess whether the final answer will be less than 20°C, between 20°C and 26°C, or greater than 26°C. Explain.

   (b) Now, find the exact answer by replicating the solution to the example in the book.

For extra practice (not due): From Chapter 19 of Knight, 4th edition: Exercises: 15, 19-21.