



# Physics Homework 1

## Due 8/11/2016

1. Estimate how many hours it would take a runner to run (at 10km/hr) across the United States from New York to Los Angeles.
2. Estimate how long it would take one person to mow a football field using an ordinary home lawn mower. Assume the mower moves at 1.5 km/hr and has a cutting width of 0.5 meters.
3. How many femtoseconds are in one year? How many years are in 3 femtoseconds?
4. Estimate how many water molecules are in your body.
5. Over the course of 2 hours, a rain storm dumps 2cm of rain over greater metropolitan Blountville. Assume Blountville is 2 miles wide and 5 miles long. How many gallons of water fell on the city?
6. **Honors Only** The rubber worn from tires mostly enters the atmosphere as particulate pollution. Estimate how much rubber (in grams) is put into the air in the United States every year. An average tire has a tread depth of 1cm when new, and the density of rubber is roughly  $1200 \text{ kg/m}^3$