Physics 132
General Physics II
Grinnell College

Homework 0

Due Monday, August 29

1. On a particular stretch of highway over a 5 minute period, 427 cars passed going east, and 325 pass going west.

a) For just the eastbound cars, what is the traffic rate in cars per minute?

b) If we had just as many cars going east as west, we could say the *net* (overall) flow of cars is zero. In our case, the two numbers don't quite match. What is the net rate (cars per minute) of traffic? Be sure to give the direction.

2. When one is counting more or less random events, such as numbers of cars passing by, the uncertainty in any given number is roughly the square root of the number. For example, if I counted fifty cars in a period of time, I wouldn't expect to get *exactly* the same number on a similar day at the same time, but the two numbers would typically be within about 7 (about the square root of 50) of one another. We would then expect to get most (about 2/3) of our values within the range from 43 to 57, or 50 ± 7. We call that number 7 the uncertainty. Given that, what is the rate (cars per minute) and the uncertainty in the rate (again in cars per minute) of just the west-bound traffic in problem 1?