Subject: UNIVERSITY PHYSICS (201320_SPRING_PHYS232N_20161): Clarification on q=e
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Date: 1/16/14 2:43 PM
To: "UNIVERSITY PHYSICS (201320_SPRING_PHYS232N_20161)":;

Hi folks,

I wanted to send out a quick clarification based on a question I received in email, because it's important to clarify this early in case there are any misunderstandings, and correct them quickly.

My notes and the text often use the symbol 'e' when discussing the unit of fundamental charge (the value of the charge of a proton or an electron). This is made explicit when I write 'e=1.602x10^−19 C'. Think of it as another type of unit −− we can express charge in terms of 'e' or Coulombs (C), just like I can express distance in terms of meters (m) or feet (ft). In the example on Wednesday, the charges involved were q=+e, q1=−e, and q2=−e.

Note that this 'e' is NOT the base of the natural logarithm (2.71828...) and you will surely get into trouble if you use 'e' in Google calculator, expecting it to be interpreted as a charge. Our 'e' for charges is in no way related to exponentials or natural logarithms in math. That's why I always convert charge 'e' into Coulombs and use that in calculations in things like Google calculator. If you want to use it in Google calculator, you should write it as "(elementary charge)" (with the quotes!), which is a lot to type! The same goes for k −− Google calculator thinks 'k' is Boltzmann's constant, which is something entirely different than the k we use in Coulomb's law.

Apologies for any confusion and thanks to the brave student for asking; I'll note this in class and add a work−through example in class that highlights some of the pitfalls of doing this sort of thing, including more gotchas like this.

See you tomorrow!

−Todd