CHEM 35
Introductory Chemistry
Quiz #1

September 8, 2000

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1. It is Olympics time! How does the 1500-meter track event compare with the good old U.S. mile race? Specifically: how many miles does a runner run in the 1500-meter race?

   Some possibly useful conversions: 1 mile = 5280 feet
                                             1 inch = 2.54 cm

   meters -> cm -> inches -> feet -> miles

1500 m x $\dfrac{100 \text{ cm}}{1 \text{ m}}$ x $\dfrac{1 \text{ inch}}{2.54 \text{ cm}}$ x $\dfrac{1 \text{ foot}}{12 \text{ in}}$ x $\dfrac{1 \text{ mile}}{5280 \text{ ft}}$ = 0.932056789 mi

   Round: Assuming 1500-m event is measured to the nearest meter, we're limited to 4 sig figs in our answer

         0.932056789 mi -> ***0.9321 miles***

2. Why does Dalton get all of the credit for developing Atomic Theory when it was Democritus who initially suggested it more than 2000 years earlier?

Dalton had evidence to support his theory (which was based on many carefully controlled experiments). Democritus's suggestion was only based on his "thought experiment" and so had no REAL evidence in support of this.

3. At the atomic/molecular scale, electromagnetic forces predominate, but gravity rules at the astronomical level. Briefly explain why.

Electromagnetic forces are based on the magnitude of charge, whereas gravitational forces vary with the magnitude of mass. Atoms and molecules have very tiny masses but very significant charges, so electromagnetic forces are large and gravitational forces tiny. Planets and starts are just the opposite: HUGE masses, but very little charge.