Name: **Period:**   **Seat#:**

These are practice problems. It is assumed that you have already been introduced to the method of "dimensional analysis." Answers are provided at the end of each problem. They are underlined. You should look at the question, work it out on paper (not in your head) before checking the answers at the end. The purpose of these problems is not merely to get the right answer, but to practice writing out the dimensional analysis setup. We will be using this method all semester and I will be asking for your setups, so don't just work out an answer on your calculator without writing out a setup.

In these practice problems, I am going to ask you to stick to ONLY the following conversions between the English and metric system (these are the only conversions that I will give you on exams). In some cases you can look up conversions elsewhere, but I would rather you didn't. I want you to learn how to make conversions that take more than one single step.

> **1 inch = 2.54 cm exactly**   **1 lb = 454 g**   **1 qt = 0.946 L**   **1 g = 1 x 10⁹ ng**
> **1 mi = 5280 ft**   **1 qt = 2 pt**   **4qt = 1 gal**

You should also remember that 1 cc = 1 cm^3 = 1 mL exactly. (This is a conversion you need to know.)
For all problems, show your dimensional analysis setup. Remember you can use the conversions shown above. Even if it is a metric conversion please practice with Dimensional Analysis, don't use "King Henry."

1) Convert 3598 grams into pounds. _7.93_

2) Convert 231 grams into ounces. _8.14_

3) A beaker contains 578 mL of water. What is the volume in quarts? _0.611_

4) How many ng are there in 5.27x10^{-13} kg? _0.527_

5) What is 7.86 x 10^{-2} kL in dL? _786_

6) What is 0.0032 gallons in cL? _1.2_

7) A box measures 3.12 ft in length, 0.0455 yd in width and 7.87 inches in height. What is its volume in cubic centimeters? _7910_

> If a unit is squared, cubed, etc. then your conversion factors will need to also be squared, cubed etc.
> 1 in = 2.54 cm   but   1 in^2 = $(2.54 \text{ cm})^2$ 1 ft = 12 in   but   1 ft^3 = $(12 \text{ in})^3$
> = 6.4516 cm^2 = 1728 in^3

8) A block occupies 0.2587 ft^3. What is its volume in mm^3? _7.326 x 10^6_

9) If you are going 55 mph, what is your speed in nm per second? _2.5 x 10^{10}_

10) If the density of an object is 2.87 x 10^{-4} lbs/cubic inch, what is its density in g/mL? _7.95 x 10^{-3}_