Assignment 3

Math 1030

Due Friday, September 14th

Name: _____

1. **Fundamental vs. Derived Units**

   For the units below make a list of the fundamental units and a list of the derived units:

   { speed, acceleration, energy, length, time, volume }

2. **Unit Conversions**

   Convert the following:

   (a) 1 kilometer into inches.

   (b) 10 gallons into liters.

   (c) 65 miles per hour into meters per second.

3. **Mixing Potions**

Professor Snape asks you to create one snarfling of Bulbous Juice. You look up the recipe in your potions book, and you find that one snarblat of Bulbous Juice requires 2 mitgars of mare sweat, and 3 goldblats of moonwater, mixed in one snarblat of water, and cooked over an open flame for three tocks per snarblat. In muggle units of grams, and seconds, how much mare sweat and moonwater will you need, and for how long will you need to cook the potion?

You may find the following conversion factors useful:

1 snarfling = 2.3 liters

1 snarblat = .7 liters

1 mitgar = 4 grams

1 goldblat = 17 grams

1 tock = 13 minutes

4. **Compound Units Problem**

   An empty water tank is in the shape of a sphere with a radius of 24 meters. Water flows into the tank at a rate of 18 cubic yards per second. How many minutes will it take until the tank is full?

   1 meter = 1.094 yards.