ENGR 130: Introduction to Engineering
Fall 2020
Quiz 1: Monday 9/14/20

Quiz 1 Review: Units and Conversions

Details: The quiz will be open resource. You may use any materials posted for the class. You MAY NOT consult any other student. Any evidence of cheating will result in a grade of ZERO.

The quiz will be distributed on Sunday Sept. 13 at noon, and you will have until 5pm on Monday Sept. 14 (more than 24 hours) to submit your files to the Quiz 1 dropbox. It should take you about 1 hour to complete the quiz.

You should complete your work on paper and submit a scan or picture to the dropbox.

The quiz will be similar to the homework problems. You should have a scientific calculator, a pencil and eraser, and your handout on the metric system and derived units.

1. **Conversions**
    a. Simple units (ex: 5 mi to km)
    b. Rates (ex: 10 ft/hr to m/s)
    c. Areas and volumes (ex: 4.5 ft^2 to in^2)

2. **Metric System**
    a. Basic units: grams (mass), meters (length), liters (volume)
    b. Prefixes determine the conversion factor
        i. kilo- 1 km = 1000 m
        ii. milli- 1 mm = $1/10^3$ m
        iii. micro- 1 µm = $1/10^6$ m
        iv. nano- 1 nm = $1/10^9$ m
        v. pico- 1 pm = $1/10^{12}$ m
    c. Conversions (3.2 m to nm, or 3.2 m to km)

3. **Simple Formulas**
    a. Area = length x width
    b. Volume = length x width x height
    c. Density ρ=mass/Volume
    d. Specific gravity SG = ρ/ρ_{water}
    e. ρ_{water} = 1 g/cm^3 = 1000 kg/m^3

Answers:

5 mi = 8.05 km

10 ft/hr = 0.00085 m/s = 8.5×10^{-4} m/s

4.5 ft^2 = 648 in^2

3.2 m = 3.2×10^9 nm

3.2 m = 0.0032 km