1. State the number of significant figures in each of the following measurements. (8 marks)
   a. 520 mL __________
   b. 0.0102 ms __________
   c. 0.290 kg __________
   d. 86,000 L __________
   e. 10.002 ns __________
   f. 0.458 Pa __________
   g. 0.001 cm __________
   h. 0.007050 cs __________

2. Perform the following calculations and report the answers to the correct number of significant figures. (8 marks)
   a. 0.3287 g x 45.2 g = ?

   b. 125.5 kg + 52.68 kg + 2.1 kg = ?

   c. \[
      \frac{52.8 \text{ L} + 3.0025 \text{ L}}{253.4 \text{ L}} = ?
   \]

   d. 0.258 mL ÷ 0.36105 mL = ?

   e. \[
      \frac{78.26 \text{ L} - 89.50 \text{ L}}{678.2 \text{ L} + 9511 \text{ L}} = ?
   \]

   f. 68.32 ns + (-1.001 ns) + (-0.00367 ns) + (-678.1 ns) = ?

   g. (1250 cal – (234.207 cal ÷ 52.69 cal)) = ?

   h. (0.12 g + 5.16 g) x (45.56 g – 93.0 g) = ?
3. Express each of the following numbers in scientific notation. (5 marks)
   a. 8960
   b. 0.00023
   c. 86,000
   d. 75,000,000
   e. 0.00000253

4. Check the following equalities for errors. If an answer is correct, write “correct” in the space provided. If the answer is incorrect, rewrite the answer to make it correct. (3 marks)
   a. 45,980,000 = 4.5980 \times 10^7
   b. 0.000253 = 2.53 \times 10^{-3}
   c. 680,502,000 = 6.80502 \times 10^8

5. Solve the following density problems. Note: density = mass / volume and has units of g/mL or g/cm$^3$. (2 marks each)
   a. An unknown liquid has a mass of 30.67 g and a volume of 52.3 mL. What is the density of the liquid?
   b. Iron has a density of 7.86 g/cm$^3$. Could a block of metal with a mass of 21.4 g and a volume of 2.56 cm$^3$ be iron? Explain.
   c. The density of gold is 19.3 g/cm$^3$. What is the mass of 18.6 cm$^3$ of gold?
   d. The density of ice is 0.917 g/cm$^3$. How much volume does 25.3 g of ice occupy?
   e. If 1.35 g of aluminum occupies 0.500 cm$^3$, what is the density of aluminum?
6. Estimate the measurement of each nail with uncertainty. (3 marks)

   a. Length of nail ____ ± ____ cm
   b. Length of nail ____ ± ____ cm
   c. Length of nail ____ ± ____ cm

7. Estimate the volume of liquid in each of the graduated cylinders with uncertainty. (4 marks)

   a. _____ ± _____ mL    b. _____ ± _____ mL    c. _____ ± _____ mL    d. _____ ± _____ mL
8. Estimate the length of each bar to 3 significant figures with uncertainty. (4 marks)

a. ___ ± ___ cm  
b. ___ ± ___ cm  
c. ___ ± ___ cm  
d. ___ ± ___ cm

9. Represent the measurements indicated by the arrow on the ruler (include the units). (2 marks)

a. ___________  
b. ___________

10. Read and record the following measurements (include the units and uncertainty). (4 marks)

a. ___________  
b. ___________  
c. ___________