1. (2 pts) Indicate whether each of the following is an extensive or intensive property.
   a) The density of water is 1.0 g/mL at 20°C.
   b) The amount of heat required to heat a pot of water.

2. (4 pts) Perform the following mathematical operation and report your answer to the correct number of significant figures. Report your answer in scientific notation. Include units.
   \[
   \frac{(6.115 \times 10^4 \text{ m}^2) (46.76 \text{ kg} - 39.018 \text{ kg})}{0.0045231 \text{ s}} =
   \]

3. (2 pts) Fill in the blanks in the table below for the isotope indicated.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>number of protons</th>
<th>number of neutrons</th>
<th>number of electrons</th>
<th>atomic number</th>
<th>mass number</th>
</tr>
</thead>
<tbody>
<tr>
<td>( ^{75}_{33}\text{As}^{3-} )</td>
<td></td>
<td>42</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. (6 pts) The concentration of a gas in a room is $7.37 \times 10^{-2} \text{ lb/ft}^3$. What volume of air (in $\text{m}^3$) contains 4.72 kg of the gas? (1.000 lb = 453.6 g, 1 in = 2.54 cm) (You MUST use dimensional analysis (factor unit method) to receive full credit!)

5. (8 pts) Correctly name or give the correct formula for the following compounds, using the Stock system where necessary. (Must be legible and correctly spelled.)

(a) (3 pts) $\text{Fe(BrO}_3\text{)}_3$

(b) (3 pts) potassium hydrogen phosphate

(c) (2 pts) dinitrogen pentoxide
6. (3 pts) Calculate the **mass** (in grams) of Al₂O₃ which contains \(3.54 \times 10^{23}\) oxygen **atoms**. (Form. wt.: Al₂O₃ = 101.96 amu). Avogadro's number = \(6.02 \times 10^{23}\) particles/mole.

7. (6 pts) C₈H₁₆O₃ undergoes complete combustion. Write the reaction and balance the equation. (Must show all work. This means to show your steps and show the atoms are balanced.)
8. (4 pts) How many **grams** of **oxygen** are required to react with 20.0 g of ammonia, \( \text{NH}_3 \), assuming they completely react according to the following equation? (At. Wt.: H = 1.01 N = 14.01, O = 16.00; Mol. Wt: \( \text{NH}_3 = 17.04 \), \( \text{O}_2 = 32.00 \), NO = 30.01, \( \text{H}_2\text{O} = 18.02 \))

\[
4 \text{NH}_3 + 5 \text{O}_2 \rightarrow 4 \text{NO} + 6 \text{H}_2\text{O}
\]

9. (5 pts) An analysis of a compound containing only carbon and hydrogen gives a mass percent composition of 87.73% C and 12.27% H. What is the **empirical formula**? **Show work!**