Quiz #1.

1. Using dimensional analysis, convert 100 gal to:
   a) L (1.00 gallon = 3.78L) (0.5pt)
   \[
   100 \text{ gallon} \times \frac{3.78 \text{ L}}{1 \text{ gallon}} = 378 \text{ L}
   \]
   b) m³ (1cm³=1mL) (1pt)
   \[
   100 \text{ gallon} \times \frac{3.78 \text{ L}}{1 \text{ gallon}} \times \frac{1000 \text{ mL}}{1 \text{ L}} \times \frac{1 \text{ cm}^3}{1 \text{ mL}} \times \frac{1 \text{ m}^3}{1000 \text{ cm}^3} = 0.378 \text{ m}^3
   \]

2. Is m³ a base unit or derived unit? (0.5pt)
   Derived unit.

3. Give the chemical formula of the ionic compounds formed from the following elements:
   a. lithium + oxygen (1pt)
      \[
      \text{Li}_2\text{O}
      \]
   b. calcium + fluoride (1pt)
      \[
      \text{CaF}_2
      \]
   c. magnesium + nitrogen (1pt)
      \[
      \text{Mg}_3\text{N}_2
      \]

4. Silver has a natural isotopes.
   a. Calculate the atomic mass of Silver given:
      \[
      \text{Silver (Ag)}: \quad \begin{array}{ccc}
      107^\text{Ag} & 106.91 \text{ amu} & \text{natural abundance (\%)} \\
      109^\text{Ag} & 108.91 \text{ amu} & 51.840 \\
      47^\text{Ag} & & 48.160
      \end{array}
      \]
      \[
      \text{atomic mass}_{\text{Ag}} = \frac{(106.91)(0.51840) + (108.91)(0.48160)}{107.863 \text{ amu}}
      \]
      \[
      = \frac{(55.433 + 52.451)}{107.863 \text{ amu}}
      \]

   b. How many neutrons does \(107^\text{Ag}\) and \(109^\text{Ag}\) each have? (1pt)
      \[
      107^\text{Ag} = 107 - 47 = 60 \text{ neutrons} \quad \text{and} \quad 109^\text{Ag} = 109 - 47 = 62 \text{ neutrons}
      \]

5. Is 100 mL of water (H₂O) a: (1pt)
   a) Substance  b) element  c) atom  d) Compound  e) Molecule  f) homogenous mixture.