Name: Answer Key Section: _____

Chem 1061 Quiz 2

You must ***show all your work*** and ***place a box around your answer*** for full credit.

1. What is the mass, in *grams*, of a *single* propane (C_3H_8) molecule?
   Atomic weight of hydrogen = 1.008 amu
   Atomic weight of carbon = 12.01 amu

$$\text{Molecular weight} = 3(12.01) + 8(1.008) = 44.094 \text{ amu}$$

$$1 \text{ molecule } C_3H_8 \times \frac{1 \text{ mol } C_3H_8}{6.02 \times 10^{23} \text{ molecules}} \times \frac{44.094 \text{ g } C_3H_8}{1 \text{ mol } C_3H_8} = 7.32458 \times 10^{-23} \text{ g} \xrightarrow{3 \text{ s.f.}} \boxed{7.32 \times 10^{-23} \text{ g}}$$

2. The empirical formula of cyclohexane is CH_2 and its molecular weight is 84.16 amu. What is cyclohexane's molecular formula?

$$\text{Empirical formula weight} = 12.01 + 2(1.008) = 14.026 \text{ amu}$$

$$n = \frac{\text{Molecular weight}}{\text{Empirical formula weight}} = \frac{84.16 \text{ amu}}{14.026 \text{ amu}} = 6.000$$

$$CH_2 \times 6 = \boxed{C_6H_{12}}$$