Friday Worksheet **Name: …….**

Gravimetric 1

1) Glyceryl trinitrate, more commonly known as nitroglycerin, is a compound of carbon, hydrogen, nitrogen and oxygen. Its molar mass is 227 g mol^{-1}.
In an analysis of nitroglycerin, it was recorded that a 1.7321 g sample contains 0.2747 g of carbon, 0.3205 g of nitrogen and 1.0988 g of oxygen.

a. Use the data recorded in the analysis to determine: the molecular formula of glyceryl trinitrate.

b. Glyceryl trinitrate is an unstable compound which, when exposed to a shock, undergoes explosive decomposition to produce carbon dioxide, nitrogen, water vapour and oxygen according to the equation

$$\mathbf{4}\text{Glyceryl trinitrate} \rightarrow \mathbf{12}CO_{2(g)} + \mathbf{10}H_2O_{(g)} + \mathbf{6}N_{2(g)} + O_{2(g)}$$

A 50.1 g sample of glyceryl trinitrate decomposes explosively in a confined space of 800 mL. If a temperature of 227 ^{o}C is generated, calculate the pressure in MPa, that results from the explosion.

When 50.0 mL of 0.168 M $AgNO_{3(aq)}$ is added to an aqueous solution of XO_4^{3-} ions, and reacts completely, a white precipitate is produced.
The precipitate is collected, dried and weighed and found to have a mass of 1.172 g.
a. Calculate the molar mass of the precipitate
b. Identify element X.
c. If the precipitate was not completely dry when weighed how would this affect the calculated molar mass? Explain your answer.