## AP Chemistry Exam Review

## Free Response Practice \#1

2008 \#2, shortened (5 points)
A student is given 2.94 g of a mixture containing anhydrous $\mathrm{MgCl}_{2}$ and $\mathrm{KNO}_{3}$. To determine the percentage by mass of $\mathrm{MgCl}_{2}$ in the mixture, the student uses excess $\mathrm{AgNO}_{3}(\mathrm{aq})$ to precipitate the chloride ion as $\mathrm{AgCl}(\mathrm{s})$.
a. Starting with the 2.94 g sample of the mixture dissolved in water, briefly describe the steps necessary to quantitatively determine the mass of the AgCl precipitate.
b. The student determines the mass of the AgCl precipitate to be 5.48 g . On the basis of this information, calculate each of the following.
i. The number of moles of $\mathrm{MgCl}_{2}$ in the original mixture.
ii. The number of percent by mass of $\mathrm{MgCl}_{2}$ in the original mixture.

