Empirical Formulas of Hydrates

Question One

Cupric chloride, $CuCl_2$, when heated to 100°C is dehydrated. If 0.235 g of $CuCl_2 \cdot x\ H_2O$ gives 0.185 g of $CuCl_2$ on heating, what is the value of x?

Molar Masses	
$CuCl_2$	134.452 g/mol
H_2O	18.015 g/mol

Question Two

If potassium aluminum sulfate hydrate, $KAl(SO_4)_2 \cdot x\ H_2O$, is heated to 100°C it leaves only $KAl(SO_4)_2$. Assume you start with 4.74 g of the hydrated compound and that the sample loses 2.16 g of water.
What is the value of x?

Molar Masses	
$KAl(SO_4)_2$	258.21 g/mol
H_2O	18.015 g/mol

Question Three

If "Epsom salt," $MgSO_4 \cdot x\ H_2O$ is heated to 250°C, all the water of hydration is lost. Upon heating a 1.687 g sample of the hydrate, 0.824 g of $MgSO_4$ remains. What is the formula of Epsom salt?