Hydrate Worksheet Name: _____
Chemistry
2 points Date: _____ Hour: _____

For the first question, the steps to solving a hydrate problem will be stated. For the rest of the worksheet, follow those steps to solve the problems.

YOU MUST SHOW WORK TO RECEIVE CREDIT!

1) A student heats a sample of hydrated cobalt (II) chloride ($CoCl_2$) in a crucible and records the data shown in the table below. What was the complete formula of the compound before heating? What was the name of the compound before heating? Show your work.

Mass of empty crucible	22.35 g
Mass of crucible + sample before heating	23.97 g
Mass of crucible + sample after heating	23.23 g

Steps for solving hydrate problems:

1. Determine how much anhydrous chemical you ended with after heating.
2. Determine how much water left the sample while heating.
3. Convert both masses to moles.
4. Determine the ratio of moles for the formula by dividing by the smallest number of moles.

Steps broken down:

(a) How much chemical did the student start with?
(Subtract empty crucible from crucible + sample before heating)

(b) How much chemical did the student end with?
(Subtract empty crucible from crucible + sample after heating)

(c) How much water left during heating? [0.74 g]
(Subtract ending mass of chemical from starting mass of chemical)

(d) What is the molar mass of cobalt (II) chloride, $CoCl_2$?
(Use the periodic table)

(e) What is the molar mass of water, H_2O?
(Use the periodic table)

(f) Convert your ending mass of chemical (from question b above) to moles using the molar mass of cobalt (II) chloride (from question d above):

$$\left(\frac{\qquad}{1}\right)\left(\frac{\qquad}{\qquad}\right) =$$

(g) Convert your mass of water lost (from question c above) to moles using the molar mass of water (from question e above):

$$\left(\frac{\qquad}{1}\right)\left(\frac{\qquad}{\qquad}\right) =$$

(h) Divide by the smallest number of moles (either your answer in question f or in question g) to determine the ratio for the formula. (Round to the nearest whole number.)

(i) Write the final formula: $CoCl_2 \cdot$ _____ H_2O

Now try one on your own. Follow the same steps!

2) A student heated a sample of hydrated magnesium iodide (MgI_2) in a crucible and recorded the data shown in the table below. What was the complete formula of the compound before heating? What was the name of the compound before heating? Show your work.

Mass of empty crucible	19.21 g
Mass of crucible + sample before heating	34.74 g
Mass of crucible + sample after heating	29.44 g