QUIZ: HONORS EXTENSION: HEAT FORMULA Name _____

$$Q = mC\Delta T$$

$$Q = mH_f$$

$$Q = mH_V$$

Material	**Specific Heat J / (kg ℃)**
Aluminum	903
Copper	710
Ice	2060
Silver	235
Steam	2020
Water	4180

Material	**Heat of Fusion (J /kg)**	**Heat of Vaporization (J/kg)**
Copper	2.05×10^5	5.07×10^6
Mercury	1.15×10^4	2.72×10^5
Gold	6.30×10^4	1.64×10^6
Iron	2.66×10^5	6.29×10^6
Silver	1.04×10^5	2.36×10^6
Water (ice)	3.34×10^5	2.26×10^6

Number 1: (heat_formula_4)
You have 0.30 kg of copper at a temperature of 24℃.
You want to completely melt this copper.
To do so, you must first heat it to the melting point of copper, and then melt it.
The melting point of copper is 1085℃.
How much heat energy is necessary to do this?

Step 1: Draw a graph with Temperature on the Y-axis and Heat Energy on the X-Axis. Label **2** separate portions of this graph.

Step 2: Solve for the heat energy of each portion of this graph.

Step 3: Combine the heat energies. Please report your answer in scientific notation with 3 significant figures. Don't forget a unit!

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Number 2:

You go to the ice store and buy a massive amount of ice, 10 kg! The initial temperature of the ice is $-5°C$.
Then, you put it in a chamber and start adding heat, until your ice has turned into steam at a temperature of $120°C$.
How much heat energy did you add?

Step 1: Draw a graph with Temperature on the Y aixs and Heat Energy on the X-Axis. Label **2** separate portions of this graph.

Step 2: Solve for the heat energy of each portion of this graph.

Step 3: Combine the heat energies. Please report your answer in scientific notation with 3 significant figures.

4. One of the stages accounts of 85 % of the heat energy added.
Which stage?

Answers:
1. Q = 2.87 x 10^5 Joules
2. Q = 2.66 x 10^7 Joules