Name:_____Period____Date_____

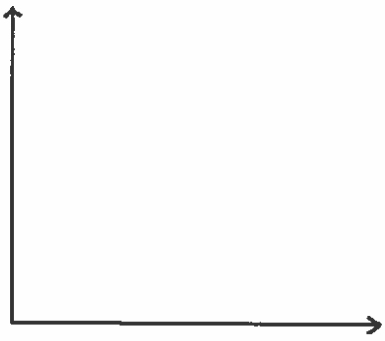
**Quiz Temperature, Heat and Enthalpy**

1. (6pts) Complete the following conversions:
   a. 24°C to Kelvin  b. 32°C to Fahrenheit  c. 99°F to Celsius

2. (3pts)You and your friend go on a picnic on a warm spring day. You would like to choose a cooler spot to sit for your picnic and have a choice between putting your picnic blanket on sandy clay (Cp = 0.33 cal/g°C) or quartz sand (0.19 cal/g°C). Assuming both areas are not shaded, which area will be cooler to picnic on? Explain your choice in terms of specific heat capacity and energy required to change it's temperature.

3. (5pts)In order to make 2 cups of hot chocolate (245 grams), milk is heated from 20°C to 95°C. This process requires 72,214 J of energy. What is the specific heat of milk?

4. (6pts)Draw an energy diagram for the following reaction. Be sure to **all** variables on your diagram including reactants, products, and the variables on the x and y axis.
PE of reactants = 350 KJ/mol
Activation Energy (Ea) = 150 KJ/mol
PE of products = 300 KJ/mol.




5. Use information from #5 to answer the following.
   a. (2pts)Is the reaction endothermic or exothermic? Explain.

   b. (2pts)What is $\Delta H$ of the reaction?

6. Given the following reaction, calculate the heat of formation.

**$NH_3(g) + HCl(g) \dashrightarrow NH_4Cl(s)$**

| | |
|---|---|
| **$NH_3$** | **-46.1 kJ** |
| **HCl** | **-92.3 kJ** |
| **$NH_4Cl$** | **-314.4 kJ** |

7. (3pts)Is the reaction in problems 8 and 9 endothermic or exothermic? Explain.

B

8.

(5) Find the ΔH for the reaction below, given the following reactions and subsequent ΔH values: $H2SO4(l) \rightarrow SO3(g) + H2O(g)$

$H2S(g) + 2\ O2(g) \rightarrow H2SO4(l)\ \Delta H = -235.5\ kJ$

$H2S(g) + 2\ O2(g) \rightarrow SO3(g) + H2O(l)\ \Delta H = -207\ kJ$

$H2O(l) \rightarrow H2O(g)\ \Delta H = 44\ kJ$

9.

(5)Find the ΔH for the reaction below, given the following reactions and subsequent ΔH values:
$N2H4(l) + CH4O(l) \rightarrow CH2O(g) + N2(g) + 3H2\ (g)$

$2\ NH3(g) \rightarrow N2H4(l) + H2(g)\ \Delta H = 22.5\ kJ$

$2\ NH3(g) \rightarrow N2(g) + 3\ H\ 2(g)\ \Delta H = 57.5\ kJ$

$CH2O(g) + H2(g) \rightarrow CH\ 4O(l)\ \Delta H = 81.2\ kJ$