

SID 

Last \_\_\_\_\_

First \_\_\_\_\_

**Question 1**

3 Points

Thallium-201 is used medically to diagnose heart problems. The half-life of thallium-201 is 72.9 hours. If you begin with 55.6 mg of this isotope, what mass remains after 193 hours have passed? Since the decomposition is a radioactive decay reaction, it is first order.

**Must Show Work for Full Credit****Question 2**

3 Points

The following initial rate data are for the oxidation of nitrogen monoxide by oxygen at 25°C:

$$2 \text{NO} + \text{O}_2 = 2 \text{NO}_2$$

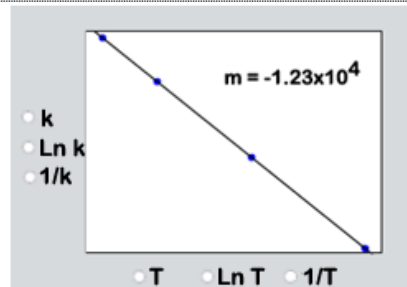
Experiment	[NO] <sub>0</sub> M	[O <sub>2</sub> ] <sub>0</sub> M	Initial Rate, M.s <sup>-1</sup>
1	9.10×10 <sup>-3</sup>	5.61×10 <sup>-4</sup>	4.20×10 <sup>-4</sup>
2	1.82×10 <sup>-2</sup>	5.61×10 <sup>-4</sup>	1.68×10 <sup>-3</sup>
3	9.10×10 <sup>-3</sup>	1.12×10 <sup>-3</sup>	8.38×10 <sup>-4</sup>
4	1.82×10 <sup>-2</sup>	1.12×10 <sup>-3</sup>	3.35×10 <sup>-3</sup>

a) What is the order of the reaction with respect to NO? \_\_\_\_\_

b) What is the overall order of the reaction? \_\_\_\_\_

**Question 3**

2 Points



The graph on the left was used to determine the Activation Energy for:

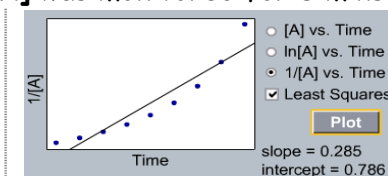
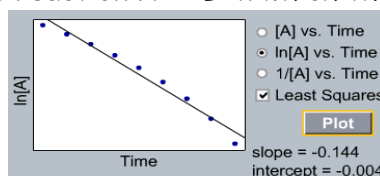
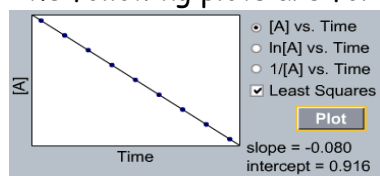


a) Circle the correct labels for graphs x and y axis?

b)  $E_a =$  \_\_\_\_\_  $\text{kJ}\cdot\text{mol}^{-1}$ **Question 4**

2 Points

The following plots are for the reaction  $\text{A} = \text{B}$  in which the [A] was monitored for 8 mins



From these plots the it can be determined that the Rate = \_\_\_\_\_ [A]\_\_\_\_\_