Name: **Period:** **Seat#:**

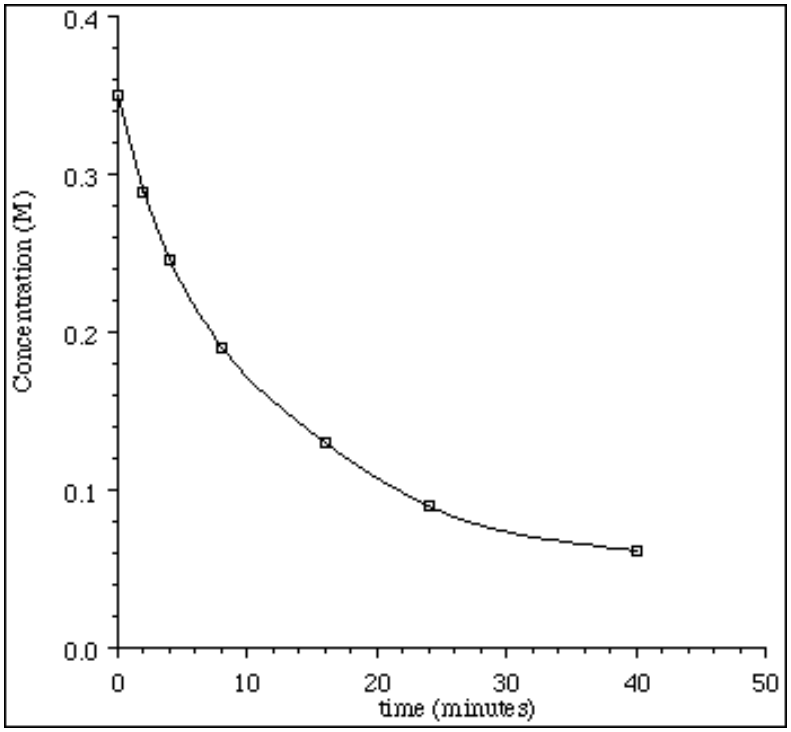
Try these problems. If you can DO them, check the box (☑). If you CANNOT do them, write some notes TO YOURSELF about what you need to study to succeed at these problems.

☐ **Rates:**

Consider the equation: $2AlBr_3 + 3K_2S \rightarrow 6KBr + Al_2S_3$
The rate of formation of KBr is 24 $mol \cdot L^{-1} \cdot s^{-1}$.
What is the rate of $AlBr_3$? _____ of K_2S? _____ of Al_2S_3? _____

☐ **Rate from a Graph:**

The concentration of a reactant is followed over time. The data is shown in a table and a graph.



	Exp. #1
Time (min)	$[NO_2]$ (M)
0	0.350
2	0.289
4	0.245
8	0.190
16	0.130
24	0.090
40	0.062

a) Determine the **average rate** between 8 and 24 minutes. (Show work.)

b) Determine the **instantaneous rate** at 8 minutes. (Show work.)

☐ Reaction Mechanisms:

The following mechanism is proposed for a reaction:

$NO + NO \rightarrow NO_2 + N$ slow

$N + O_2 \rightarrow NO_2$ fast

Write the equation for the overall reaction. Identify any reactive intermediates.

☐ Orders of Reaction/Rate Laws:

Nitrogen(II) oxide and hydrogen react to form nitrogen and water according to this equation.

$$2NO(g) + 2H_2 \rightarrow N_2(g) + 2H_2O(g)$$

According to these experimental results, what are the orders for NO and H_2O?

[NO]	$[H_2]$	Rate($mol \cdot L^{-1} \cdot min^{-1}$)
0.015	0.020	0.60
0.015	0.040	1.20
0.030	0.020	2.40

Write the rate law for this reaction: