Chem 10123, Quiz 5 Name: _____
March 4, 2020 (Please Print)

1. The simple reaction, A $\longrightarrow$ B + C, is thought to be a ***first order*** process. In one kinetics experiment, the following data was obtained.

[A]	0.300	0.222	0.150	0.108	0.0750	0.0521	0.0375
Time (sec)	0	20	40	60	80	100	120

(a) (2 points) How would you plot this data to confirm that the reaction is actually first order?

(b) (5 points) Determine the instantaneous rate of this reaction in units of mole/L·sec at time t = 30 seconds. ***Show a calculation.***

(b) (3 points) Assuming that it is first order, the half-life of this reaction is _____ sec and the rate constant (k) is _____ sec^{-1}.

2. (10 points) A kinetic study of the following gas-phase reaction gave the concentration *vs* initial rate data summarized below. $2\ A + B_2 \longrightarrow 2\ AB$

Expt	**[A]**	**[B_2]**	**initial rate** (mole/L·sec)
(1)	0.250	0.100	1.375×10^{-4}
(2)	0.650	0.450	1.972×10^{-3}
(3)	1.250	0.450	7.291×10^{-3}
(4)	1.250	0.100	3.438×10^{-3}

Determine the **rate law** for this reaction. **Clearly SHOW how you arrive at your answer**. (It is not necessary to determine the rate constant, k.)