Name: _____

Period: ____

Rate Laws

General form of a rate law is **rate = $k[A]^x[B]^y$** for a reaction with two reactants

1. Use the data table below to answer questions about the reaction **$A_2 + B_2 \rightarrow 2\,AB$**

Trial	$[A_2]$	$[B_2]$	Rate (M/s)
1	0.01	0.05	0.01
2	0.01	0.10	0.02
3	0.02	0.10	0.04

   a. What trials do you use to determine the effect of $[A_2]$ on the reaction rate?

   b. What is the rate order (the exponent) with respect to $[A_2]$?

   c. What trials do you use to determine the effect of $[B_2]$ on the reaction rate?

   d. What is the rate order (the exponent) with respect to $[B_2]$?

   e. What is the rate law for this reaction?

2. Use the data table below to answer questions about the reaction **$C + D \rightarrow E$**

Trial	[C]	[D]	Rate (M/s)
1	0.1	0.01	0.02
2	0.1	0.02	0.04
3	0.2	0.02	0.16

   a. What trials do you use to determine the effect of [C] on the reaction rate?

   b. What is the rate order (the exponent) with respect to [C]?

   c. What trials do you use to determine the effect of [D] on the reaction rate?

   d. What is the rate order (the exponent) with respect to [D]?

   e. What is the rate law for this reaction?

3. Use the data table below to answer questions about the reaction **C + D → E**

Trial	[C]	[D]	Rate (M/s)
1	0.1	0.01	0.02
2	0.1	0.02	0.08
3	0.1	0.03	0.18
4	0.1	0.04	0.32
5	0.2	0.04	1.28
6	0.3	0.04	2.88

a. What trials do you use to determine the effect of [C] on the reaction rate?

b. What is the rate order (the exponent) with respect to [C]?

c. What trials do you use to determine the effect of [D] on the reaction rate?

d. What is the rate order (the exponent) with respect to [D]?

e. What is the rate law for this reaction?

4. Use the data table below to answer questions about the reaction **F + G → H**

Trial	[F]	[G]	Rate (M/s)
1	0.01	0.4	0.02
2	0.02	0.4	0.16
3	0.03	0.4	0.54
4	0.1	0.2	5
5	0.1	0.4	20
6	0.1	0.6	45

a. What trials do you use to determine the effect of [F] on the reaction rate?

b. What is the rate order (the exponent) with respect to [F]?

c. What trials do you use to determine the effect of [G] on the reaction rate?

d. What is the rate order (the exponent) with respect to [G]?

e. What is the rate law for this reaction?