Review Sheet-

The concepts in chapter 14 boil down in to the few main concepts. The Table below summarizes the mathematical relationships that must be mastered.

Summary of the Kinetics for Reactions of the Type $aA \longrightarrow$ Products that are Zero, First, or Second Order in [A]

	Order		
	Zero	**First**	**Second**
Rate Law:	Rate = k	Rate = k[A]	Rate = $k[A]^2$ or Rate = k[A][B]
Integrated Rate Law:	$[A] = -kt + [A]_0$	$\ln[A] = -kt + \ln[A]_0$ $\ln\left(\frac{[A]_0}{[A]_t}\right) = kt$ $\ln[A]_0 - \ln[A]_t = kt$	$\frac{1}{[A]} = kt + \frac{1}{[A]_0}$
Plot Needed to Give a Straight Line:	[A] versus t	ln [A] versus t	$\frac{1}{[A]}$ *versus* t
Relationship of Rate Constant to the Slope of Straight Line:	Slope = -k	Slope = -k	Slope = k
Half-Life:	$t_{\frac{1}{2}} = \frac{[A]_0}{2k}$	$t_{\frac{1}{2}} = \frac{0.693}{k}$	$t_{\frac{1}{2}} = \frac{1}{k[A]_0}$

You must be able to use tabulated data to find out rate laws using the initial rate method **(page 585-586)** as well as the integrated rate law (graphing) approach **(page 587-590)** .

The table below summarizes the needed information for reaction mechanism

Rate Laws for General Elementary Steps

Elementary Step	Molecularity	Rate Law
$A \longrightarrow$ product	Unimolecular	Rate = k[A]
$2A \longrightarrow$ product	Bimolecular	Rate = $k[A]^2$
$A + B \longrightarrow$ product	Bimolecular	Rate = k[A][B]
$2A + B \longrightarrow$ product	Termolecular	Rate = $k[A]^2[B]$

You must be able to determine rate laws by looking at a proposed mechanism. (Page 602-606) ***Remember, all reactants before and in the slow or rate determining step must be represented in the rate law.***