Kinetics Reference Sheet

How do I relate reaction order to rate law, integrated rate law, and linear plots?

Reaction Order	0	1	2
Rate Law	Rate = k x $[A]^0$ = k	Rate = k x $[A]^1$=k x [A]	Rate = k x $[A]^2$
Integrated Rate Law (Finding concentration at a certain time t)	$[A]_t = [A]_o - kt$	$\ln [A]_t = \ln[A]_o - kt$ $[A]_t$= e^ $\ln[A]_o - kt$	$1/[A]_t = 1/[A]_o + kt$ $[A]_t = (1/[A]_o + kt)^{-1}$
Half Life	$[A]_o/2k$	0.693/k	$1/ (k \times [A]_o)$
Linear Plot	$[A]_t$ vs t	$\ln [A]_t$ vs t	$1/[A]_t$ vs t
Slope of linear plot	-k	-k	k

Note: $[A]_o$ refers to original concentration of A. $[A]_t$ refers to concentration of A at a certain time, t.

Adapted from Gary S Thorpe, Cliff's Advanced Placement Chemistry Preparation Guide. 1996, Cliff's Notes, 2nd Edition

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