Rate Law Expression Value of Rate Constant, *k*, from Data

Overall reaction is third order (**2 +1**)

rate = $k\,[NH_4^+]^2[NO_2^-]^1$

Trial	$[NH_4^+]$	$[NO_2^-]$	Initial Rate ($M\,s^{-1}$)	$k = \frac{rate}{[NH_4^+]^2 \times [NO_2^-]^1}$
1	0.100 *M*	0.0500 *M*	1.50×10^{-3}	$3.00\ M^{-2}\ s^{-1}$
2	0.100 *M*	0.100 *M*	3.00×10^{-3}	$3.00\ M^{-2}\ s^{-1}$
3	0.200 *M*	0.100 *M*	1.20×10^{-2}	$3.00\ M^{-2}\ s^{-1}$

There is almost always a question on the reaction order constant on the AP Exam.

One point is given for the value and one point is given for the unit!

You can get half of the points for this type of the problem just for the unit!

example	overall all order, *n*	rate constant, *k*, units	rate units
rate=$k[A]^0$	0	$M\ s^{-1}$	$M\ s^{-1}$
rate=$k[A]^0[B]$	1	s^{-1}	$M\ s^{-1}$
rate=$k[A]\,[B]$	2	$M^{-1}\ s^{-1}$	$M\ s^{-1}$
rate=$k[A]^2[B]$	**3**	$\boldsymbol{M^{-2}\ s^{-1}}$	$\boldsymbol{M\ s^{-1}}$
rate=$k[A]^x[B]^y$	$\boldsymbol{n = x + y}$	$\boldsymbol{M^{(1-n)}\ s^{-1}}$	$\boldsymbol{M\ s^{-1}}$