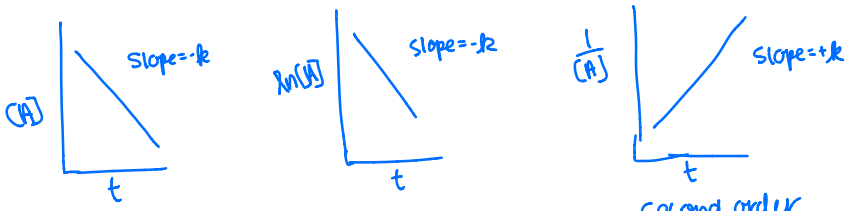
3 orders



zero order
Rate = $k[A]^0$
$[A]_t = -kt + [A]_0$
$y = mx + b$

First order
Rate = $k[A]^1$
$\ln[A]_t = -kt + \ln[A]_0$
$y = mx + b$

second order
Rate = $k[A]^2$
$\frac{1}{[A]_t} = kt + \frac{1}{[A]_0}$
$y = mx + b$

14.8 Plot all 3 ways
Rate = $k[NO_2]^2$

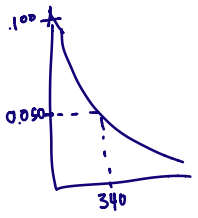
14.7 $\ln[A]_t = -kt + \ln[A]_0$
give you
5×10^{-7} g/cm³
1.45 year

a) $\ln[A]_t = -(1.45 \text{ year}^{-1})t + \ln(5 \times 10^{-7})$
$[A]_{1 \text{ year}} = 1.2 \times 10^{-7}$ g/cm³

b) $\ln[A]_t = -kt + \ln[A]_0$
$\ln[3 \times 10^{-7}] = -(1.45t) + \ln[5 \times 10^{-7}]$
0.35 year = t

14.9 First order: $t_{.5} = \frac{0.693}{k}$

First order
a) $t_{1/2} = 340$ sec
b) $340 s = \frac{.693}{k}$



$k = 2.0 \times 10^{-3}\ s^{-1}$