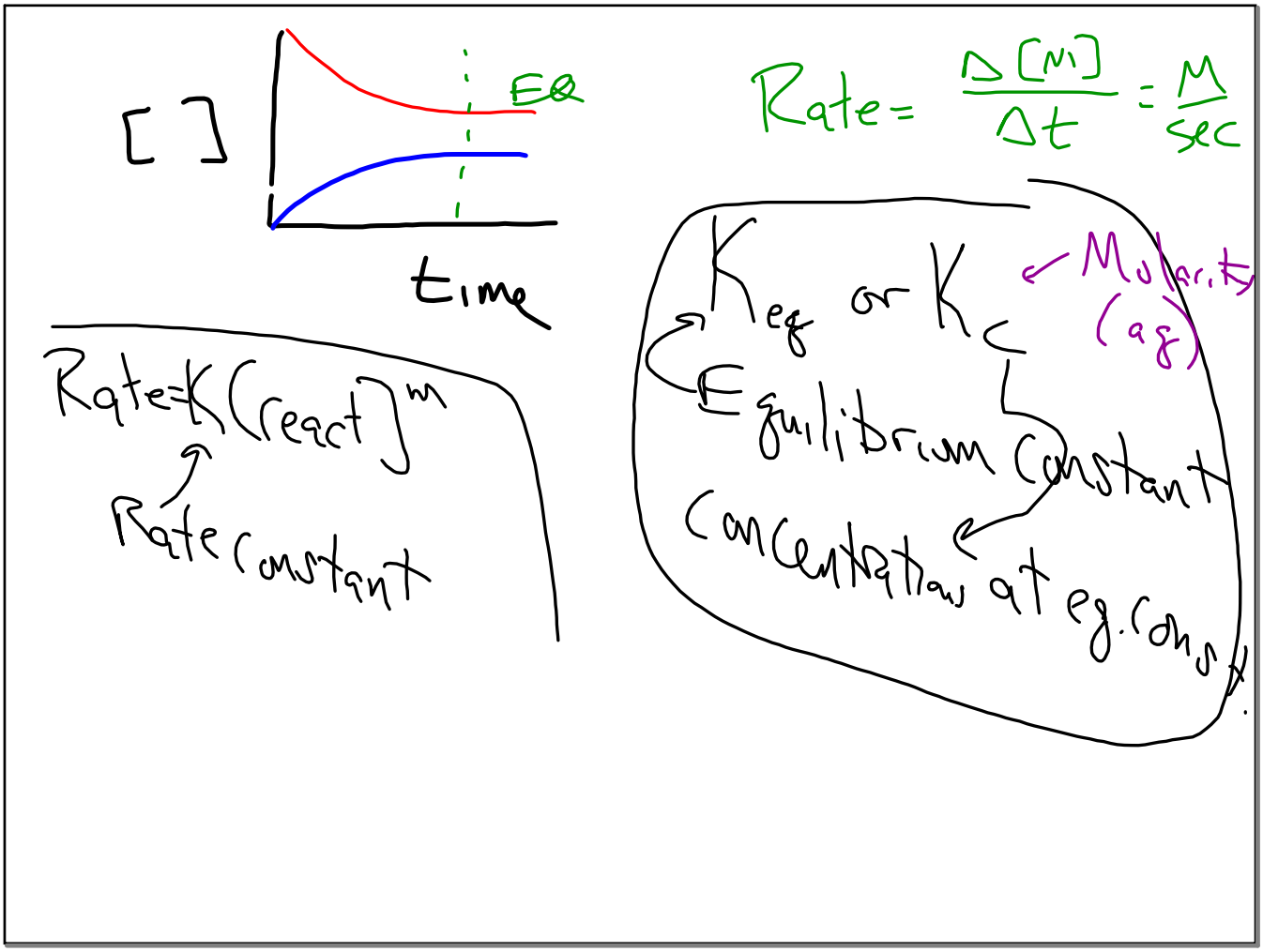
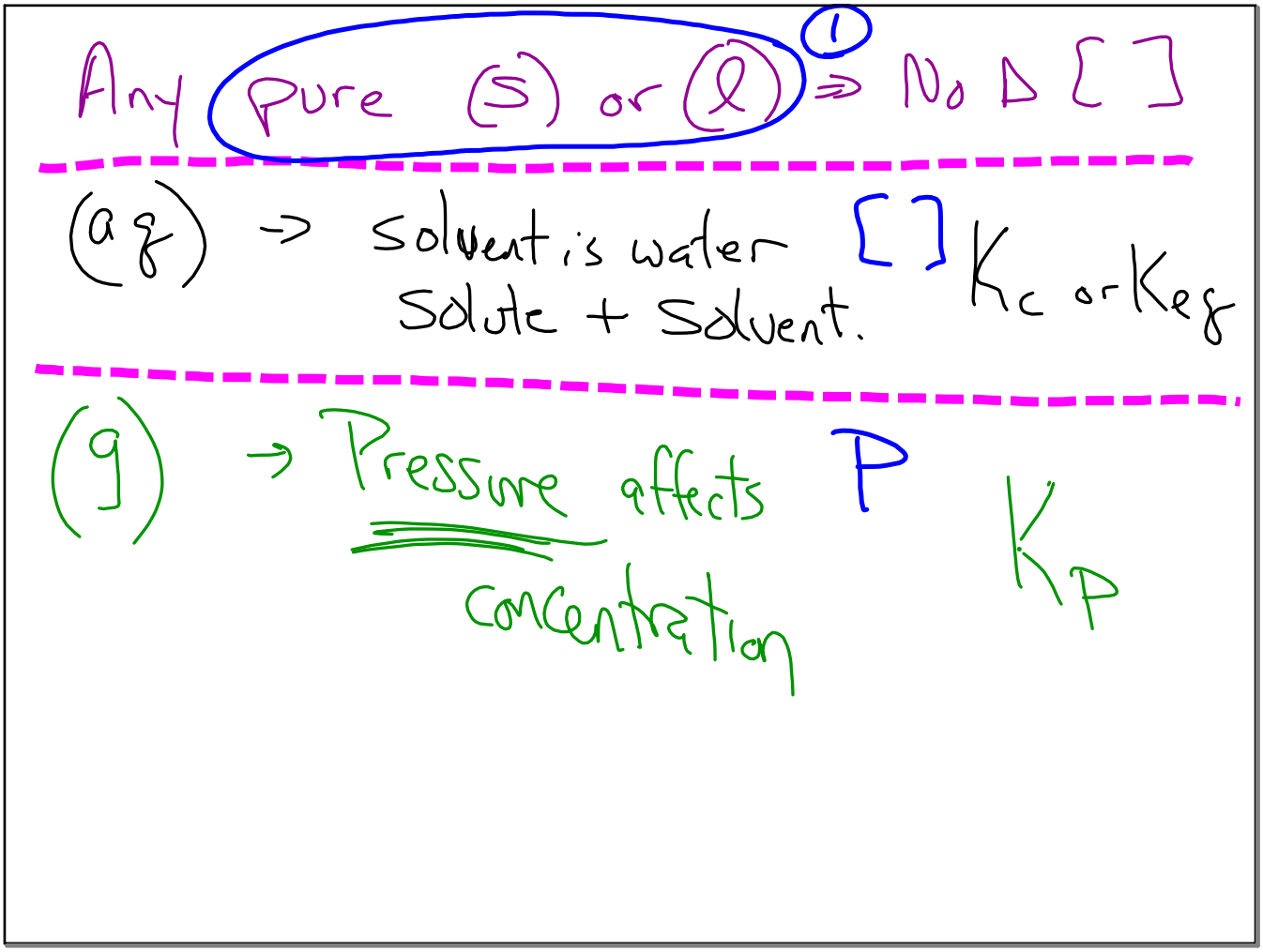

[ ]
EQ
time
Rate = Δ[M] / Δt = M / sec
Rate = K [react]^m
Rate constant
K_eq or K_c
Molarity (aq)
Equilibrium constant
Concentration at eq. conds

Feb 16-9:11 AM


Any pure (s) or (l) ⇒ No Δ [ ]
1
(aq) → solvent is water
Solute + Solvent.
[ ] Kc or Keq
(g) → Pressure affects P
Kp
concentration

Feb 16-9:49 AM

$$a\,A_{(g)} + b\,B_{(g)} \rightarrow c\,C_{(g)} + d\,D_{(g)}$$

$$K = \frac{[\text{Products}]^{\text{coeff}}}{[\text{Reactants}]^{\text{coeff}}} = \frac{[C]^c\,[D]^d}{[A]^a\,[B]^b}$$

Mass action expression.

Feb 16-9:57 AM

$$H_2SO_{4(aq)} \rightleftharpoons 2H^+_{(aq)} + SO_4^{-2}{}_{(aq)}$$

$$K_c = \frac{[H^+]^2 [SO_4^{-2}]}{[H_2SO_4]}$$

$$2O_{3(g)} \rightleftharpoons 3O_{2(g)}$$

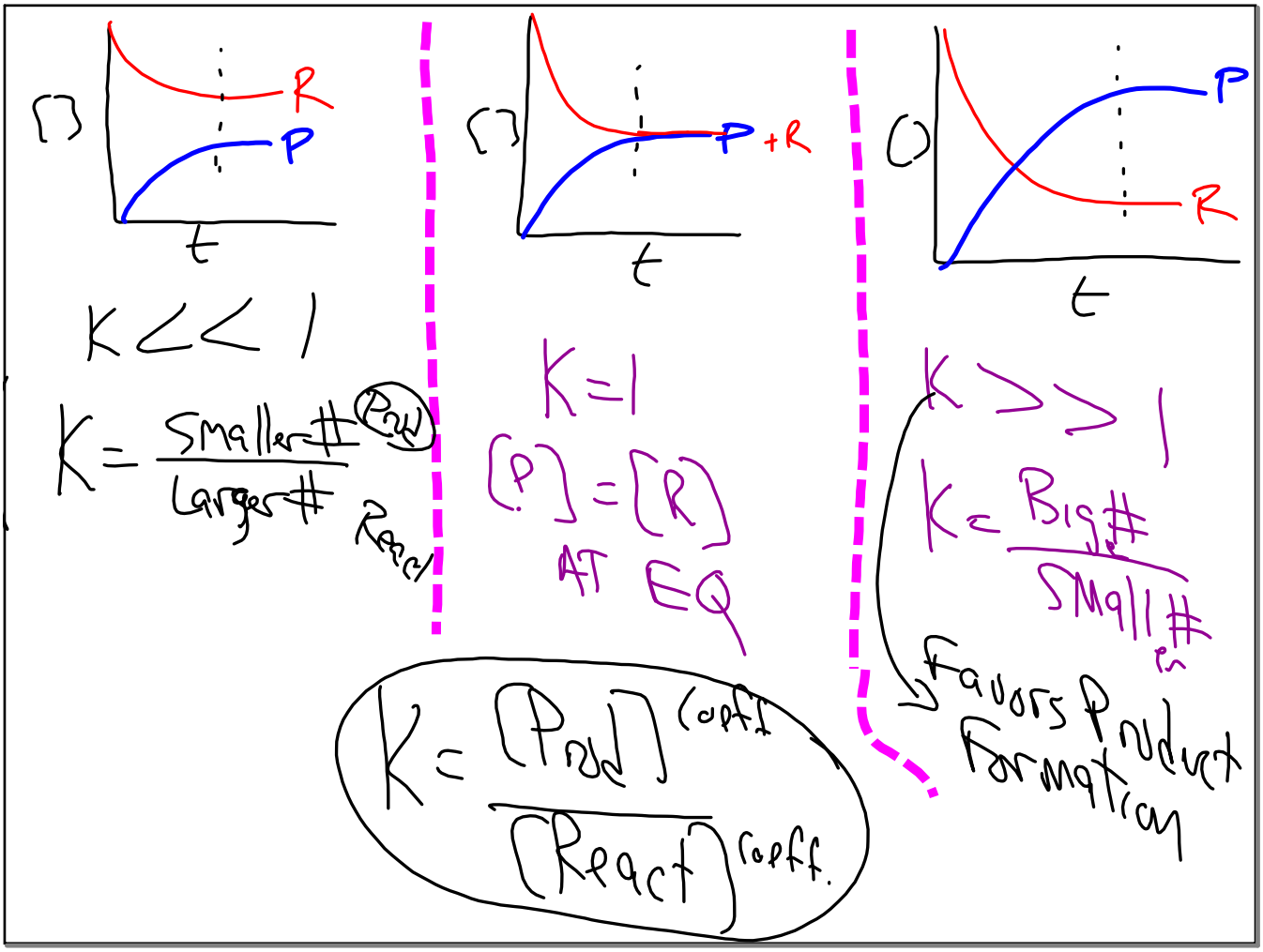
$$K_p = \frac{(P_{O_2})^3}{(P_{O_3})^2}$$

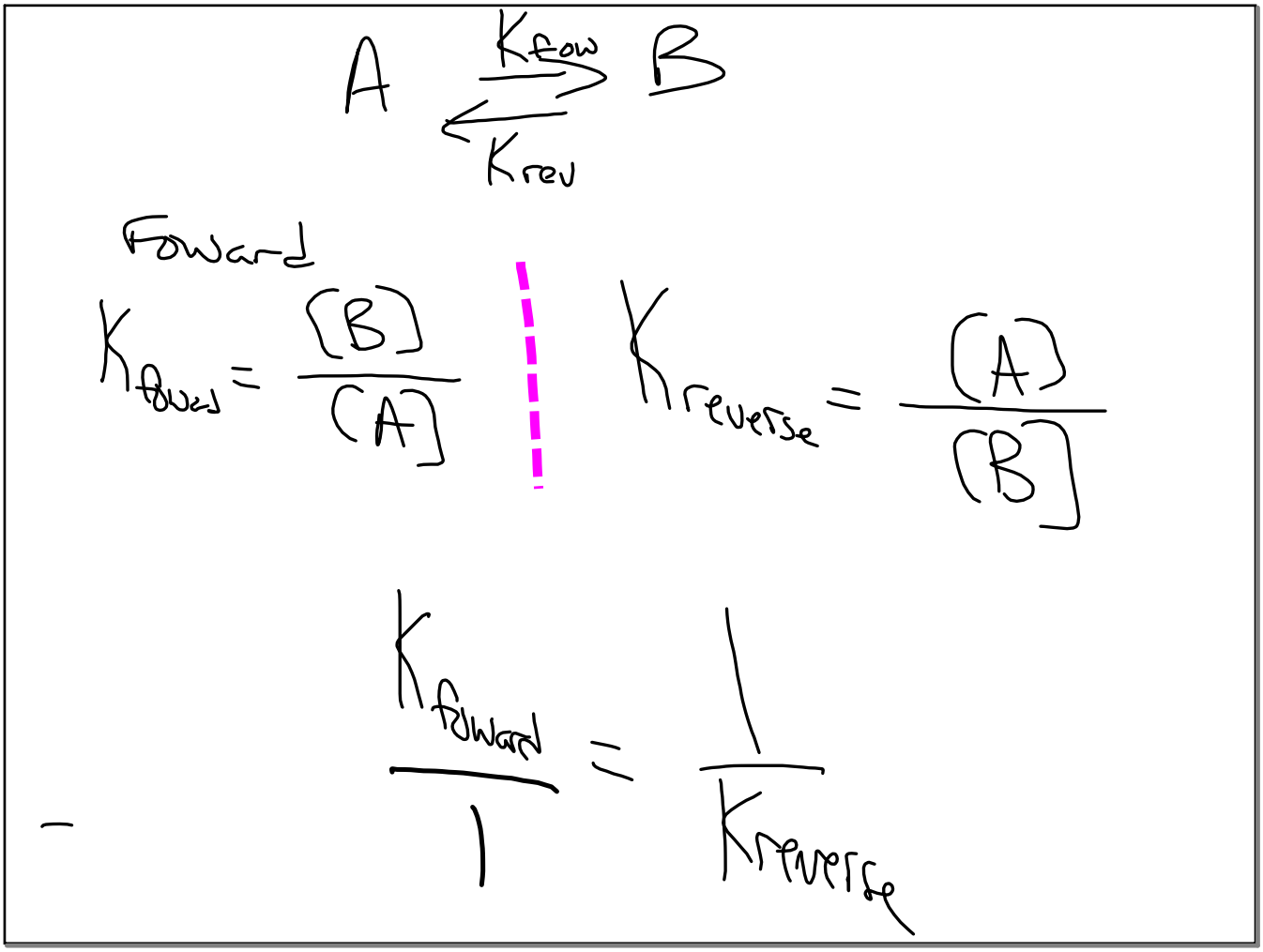
Feb 16-9:59 AM

$$2H_2O_{(\ell)} \rightleftharpoons 2H_{2(g)} + O_{2(g)}$$

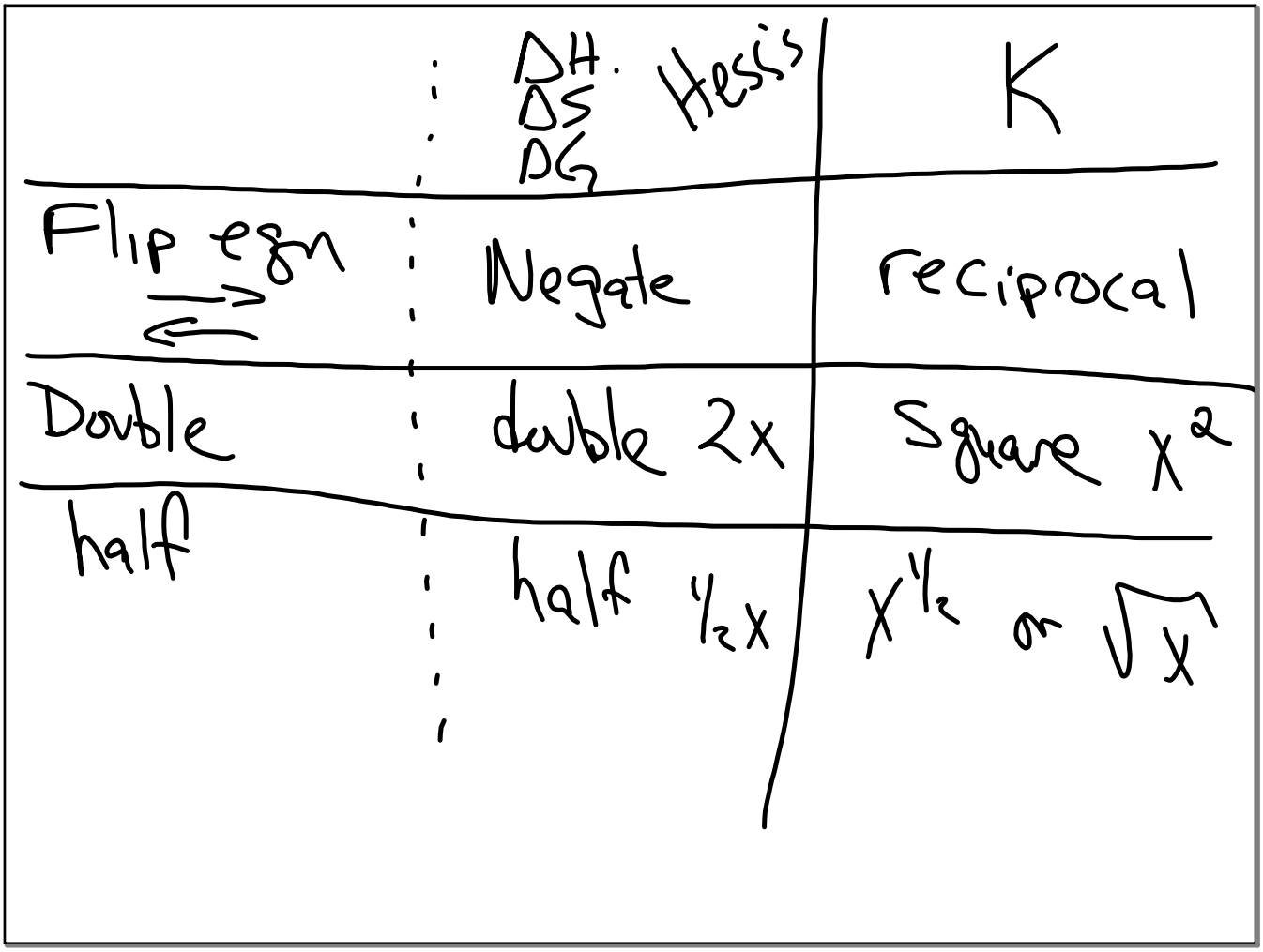
$$K_p = \frac{(P_{H_2})^2 (P_{O_2})}{1}$$

Feb 16-10:05 AM


[ ]
R
P
t
K << 1
K = Smaller # / Larger #
Prod
React
[ ]
P + R
t
K = 1
[P] = [R]
AT EQ
[ ]
P
R
t
K >> 1
K = Big # / Small #
Favors Product Formation
K = [Prod]^coeff / [React]^coeff.



Feb 16-10:26 AM



Feb 16-10:29 AM

Fractional exponents

$X^{\frac{1}{2}} = \sqrt{X^1}$ (Power / Root)

$X^{\frac{2}{3}} = \sqrt[3]{X^2}$

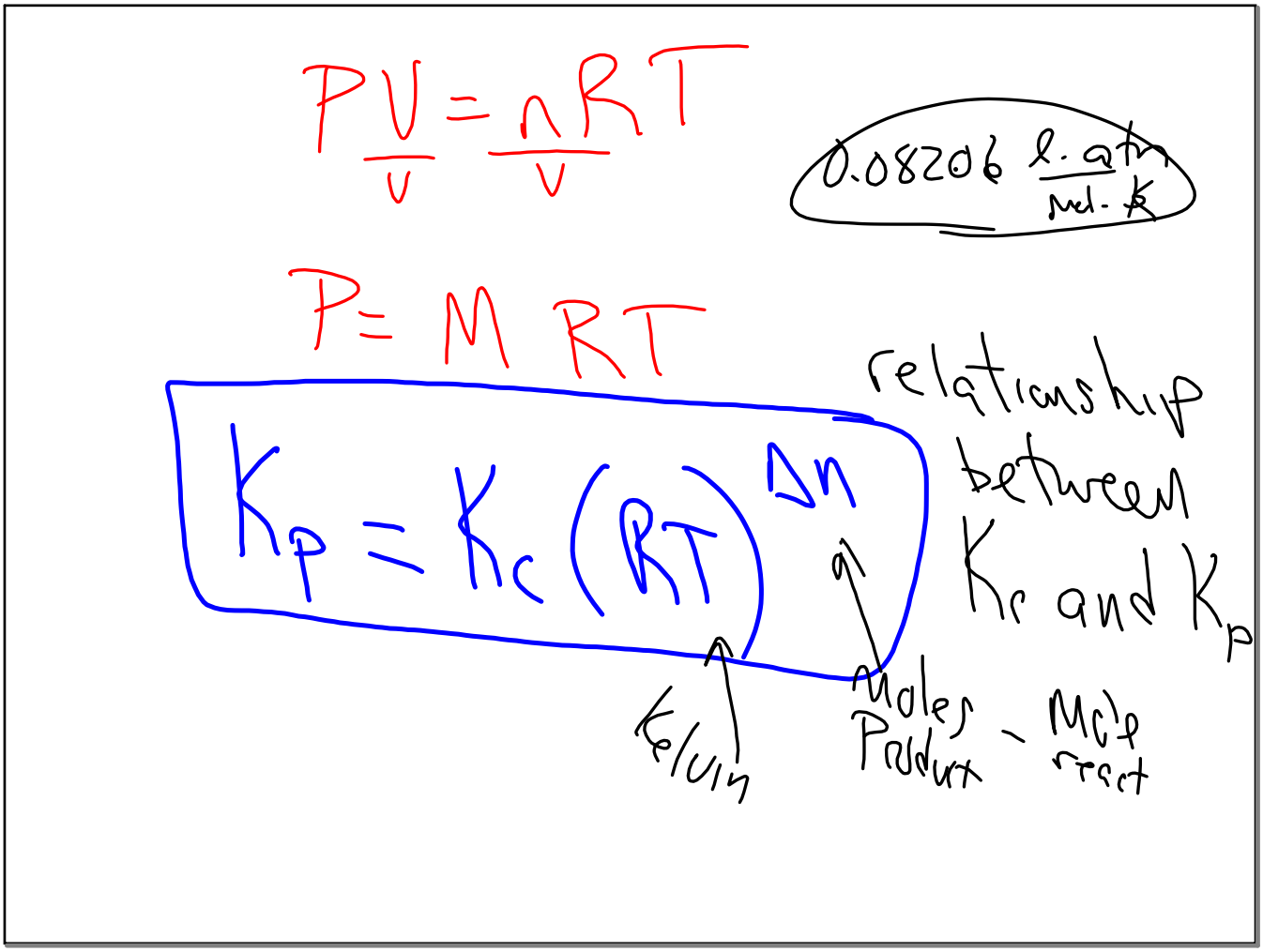
Feb 16-10:34 AM

Flip eqn (reciprocal) and triple it (3rd power)

$A \rightarrow 2B \qquad K$

$6B \rightarrow 3A \qquad \left(\frac{1}{K}\right)^3 \text{ or } \frac{1}{K^3}$

Feb 16-10:35 AM



Feb 16-10:37 AM

$$N_{2(g)} + 3H_{2(g)} \rightleftarrows 2NH_{3(g)}$$

$\Delta n = 2 - (1+3) = -2$

$K_c = 9.6$ at 300°C Find K_p

$$K_p = 9.6\left[(0.08206)(573)\right]^{-2}$$

$$= \frac{9.6}{\left[(0.08206)(573)\right]^2}$$

$P = MRT$

$K_p = K_c(RT)^{\Delta n}$

Chap 15 / 14, 22

Feb 16-10:46 AM