①

Prof. Panjikh. P
Lec. 6.
Date-4-3-11

$$\frac{d}{dx}\left[x \cdot x\right]$$

$$\Rightarrow \frac{d}{dx}\left[x^2\right]$$

$$\frac{d}{dx}x^n = n\,x^{n-1}$$

$$n = 2$$

$$\frac{d}{dx}\left[x^2\right] = 2x$$

$$\frac{d}{dx}\left(f(x) \cdot g(x)\right] = \frac{df}{dx}g + f\frac{dg}{dx}$$

$f(x) = x$

$g(x) = x$

$$\frac{d}{dx}\left[x \cdot x\right] = \underbrace{\left(\frac{dx}{dx}\right)}_{1} x + x \underbrace{\left(\frac{dx}{dx}\right)}_{1}$$

$$x + x = 2x$$

$$\frac{d}{dx}(AX)$$

$$= \underline{\frac{dA}{dx}X} + A\frac{dX}{dx}$$

A= constant eg: 2

$$\Rightarrow \frac{dA}{dx} = 0$$

$$\boxed{\frac{d}{dx}AX = A}$$

③

$$\frac{d}{dx}\left[A x^2\right]$$

$$= \underbrace{\frac{dA}{dx}}_{\downarrow \, 0} x^2 + A \frac{d}{dx} x^2$$

$$= 0 + A\,2x$$

$$= 2Ax$$

(a)

$$e^x = 1 + x + \frac{x^2}{2} + \frac{x^3}{6} \cdots$$

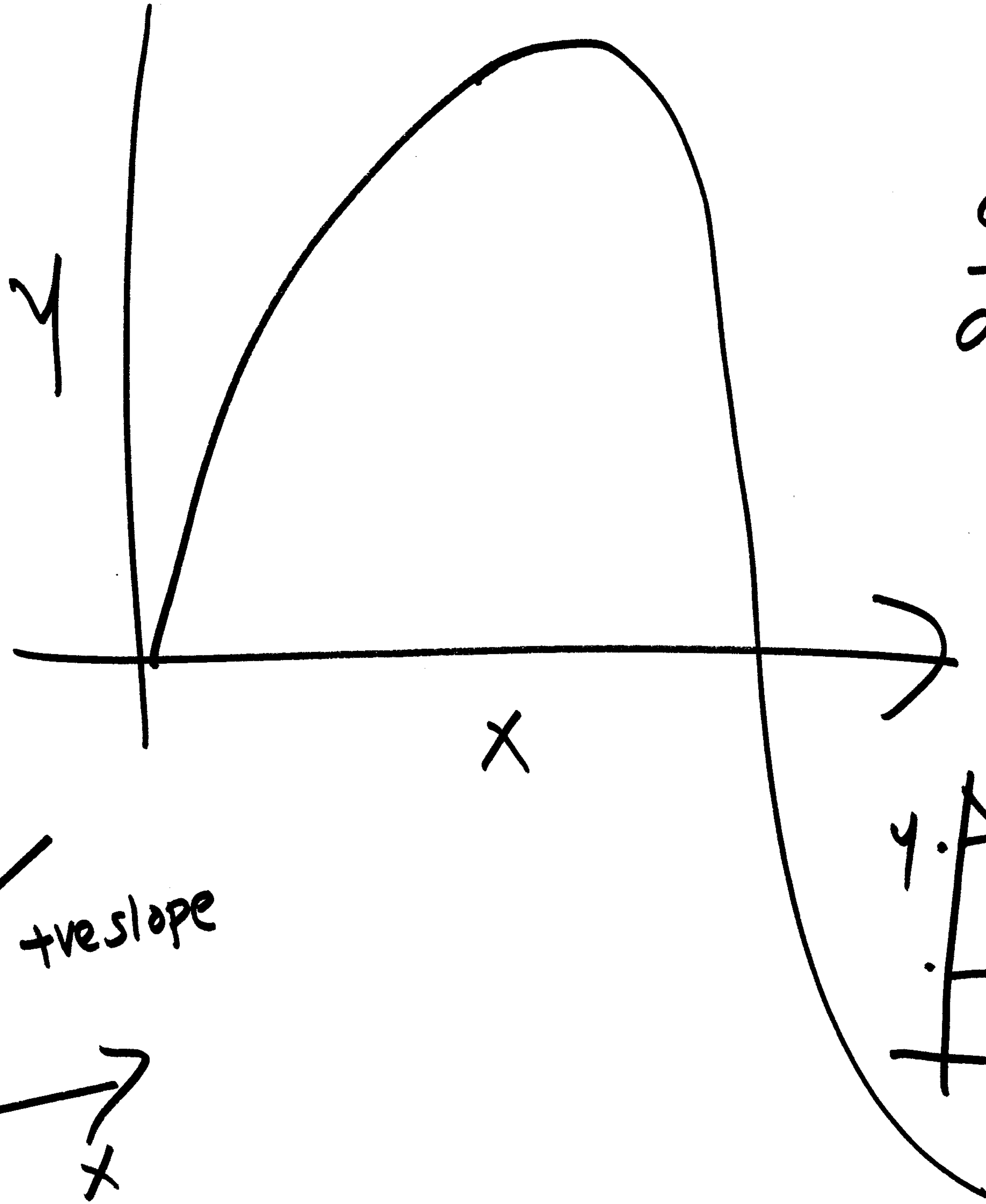
$$\frac{d}{dx} e^x = \frac{d}{dx}\left[ \underline{1} + \underline{x} + \frac{x^2}{\underline{2}} + \frac{x^3}{\underline{6}} \right]$$

$$= \frac{d1}{dx} + \frac{dx}{dx} + \frac{d}{dx}\left(\frac{x^2}{2}\right) + \frac{d}{dx}\left[\left(\frac{x^3}{6}\right)\right]$$

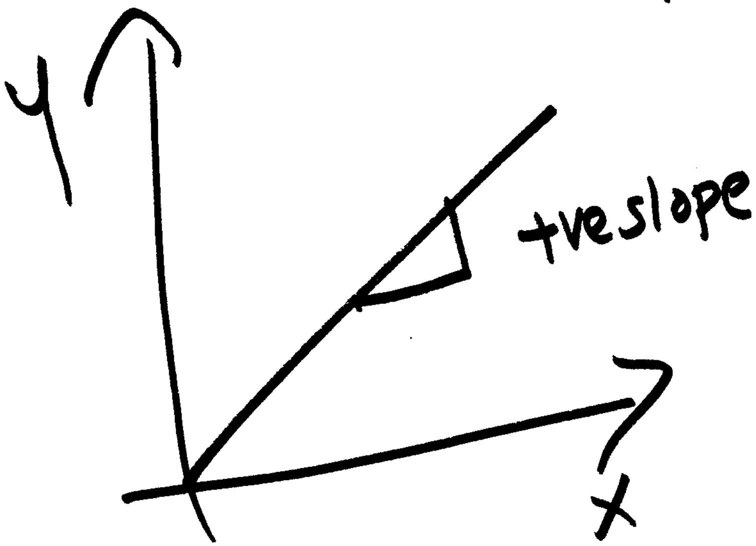
$$\downarrow 0 \qquad 1 + \frac{d}{dx}\left[\frac{1}{2} \cdot x^2\right] + \frac{d}{dx}\left[\frac{1}{6} \cdot x^3\right]$$

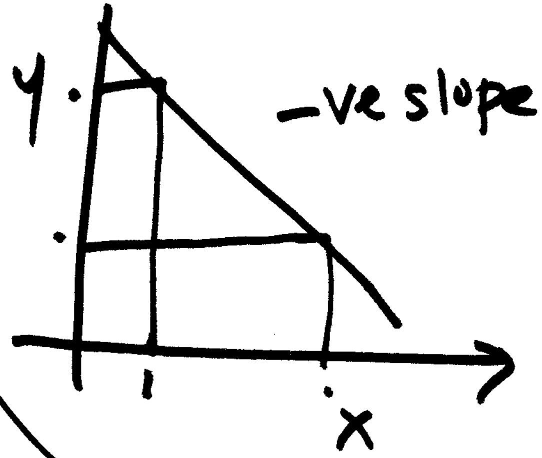
$$= e^x$$

5

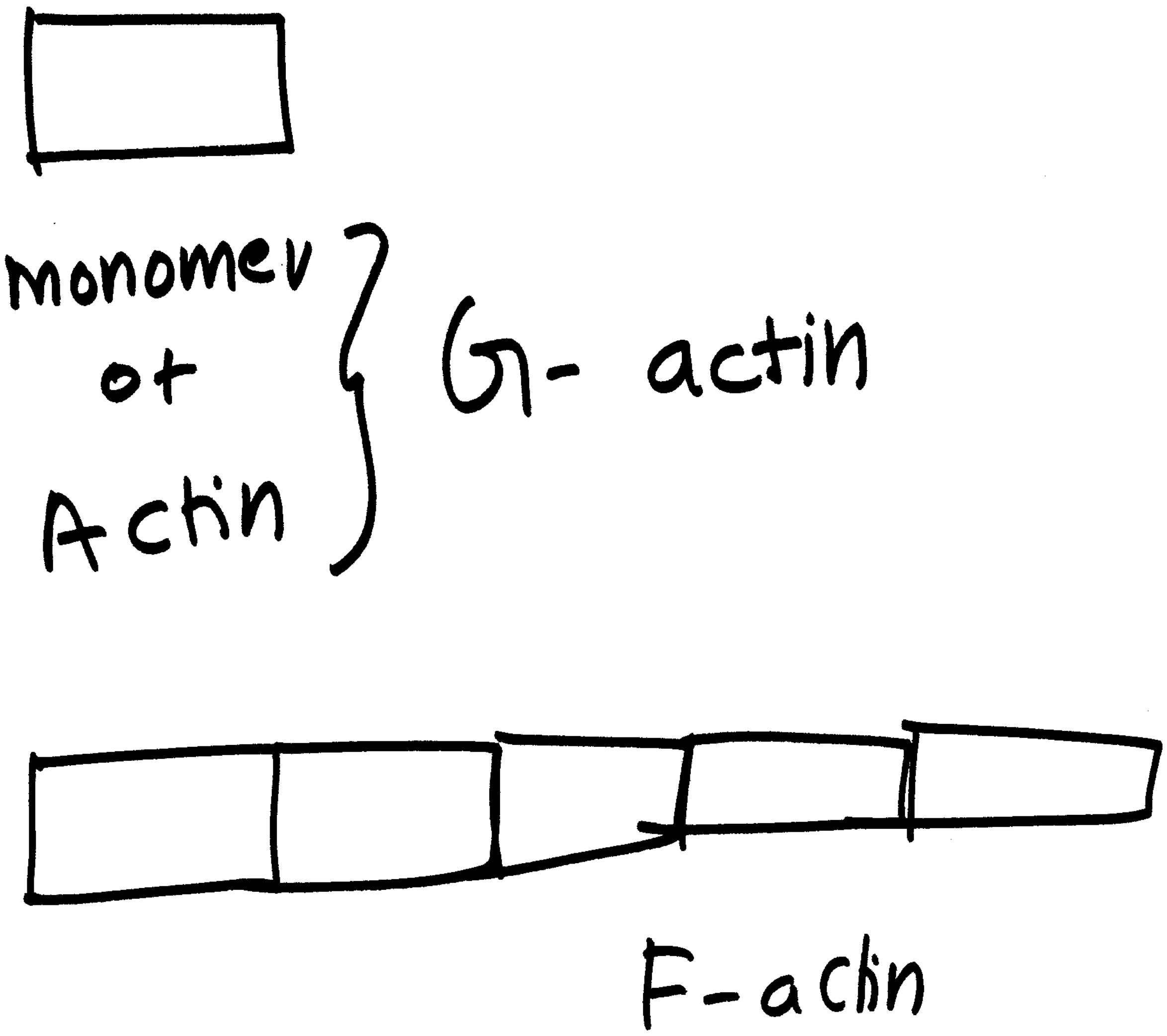


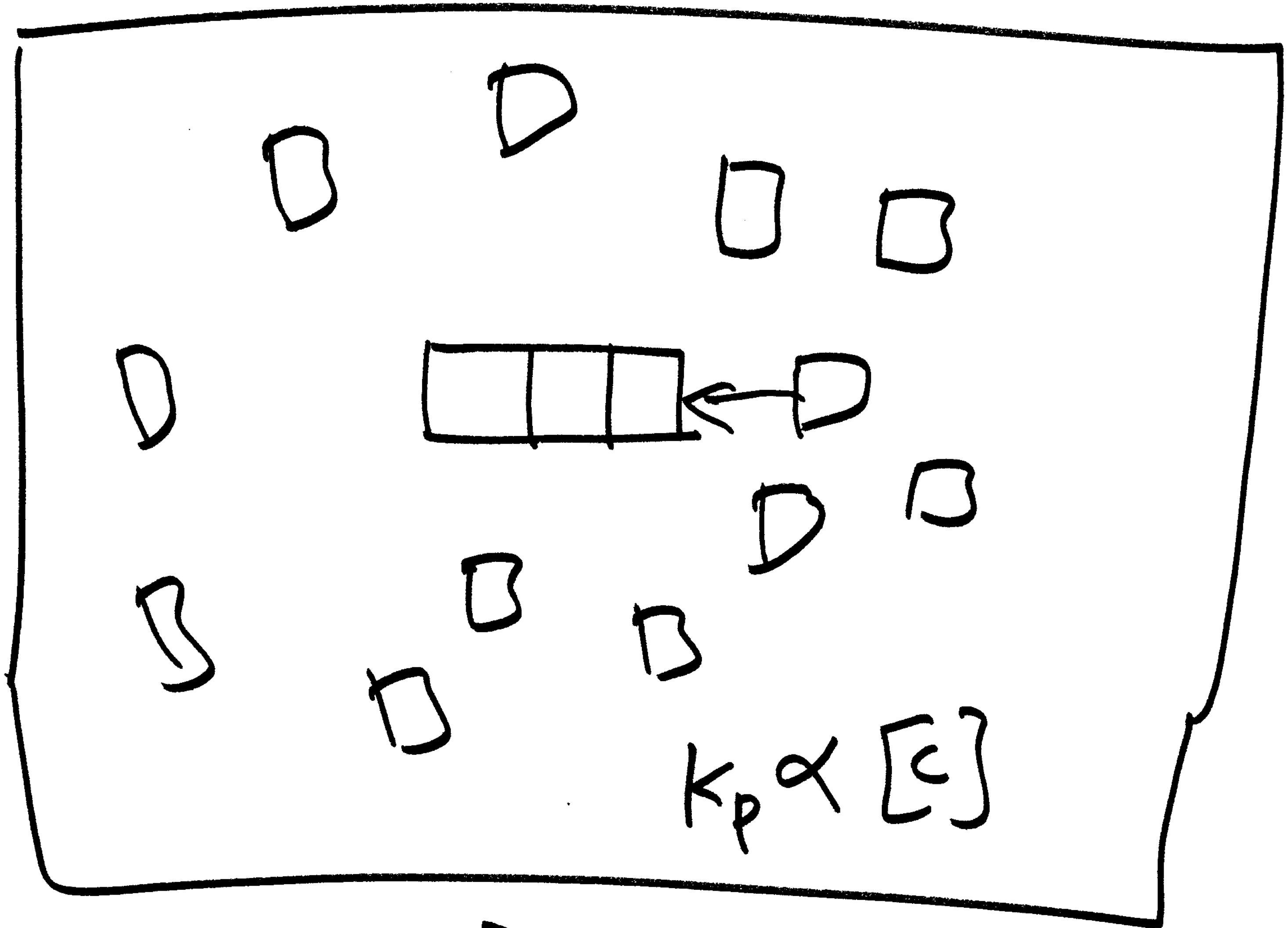

$$\frac{dy}{dx} > 0$$



6






$[C]$: $\square$ concentration $= \dfrac{N}{V}$

M.F. Carlier

9

T. Pollard

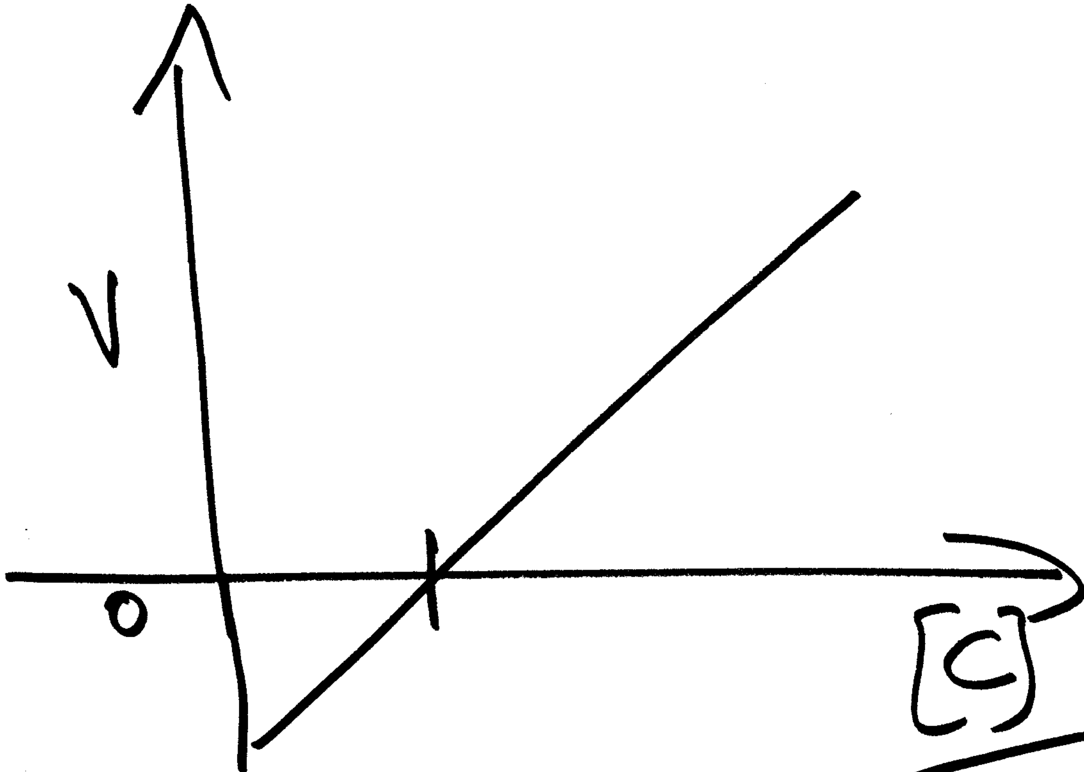
google scholar

scholar.google.com

Papers in late 1970s early 1980s

$$k_p = k_d$$

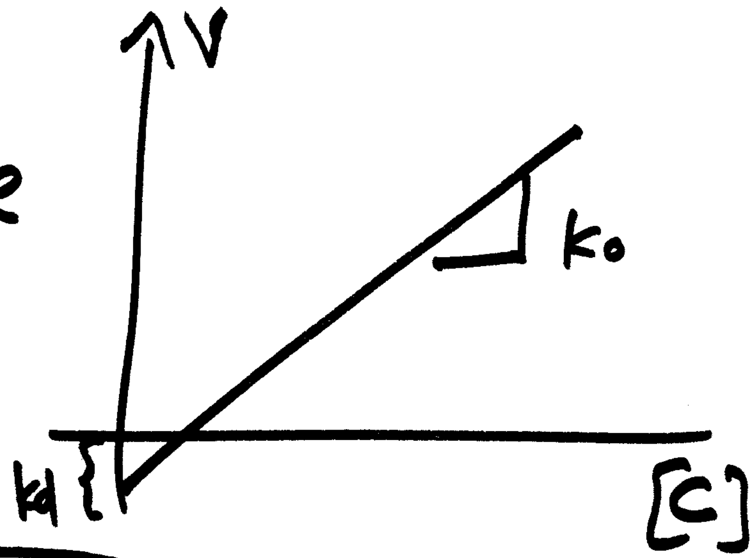
⑩




$$k_o[C] = k_d \Rightarrow \boxed{[C] = \frac{k_d}{k_o}}$$

$$V = k_o C - k_d$$ 11

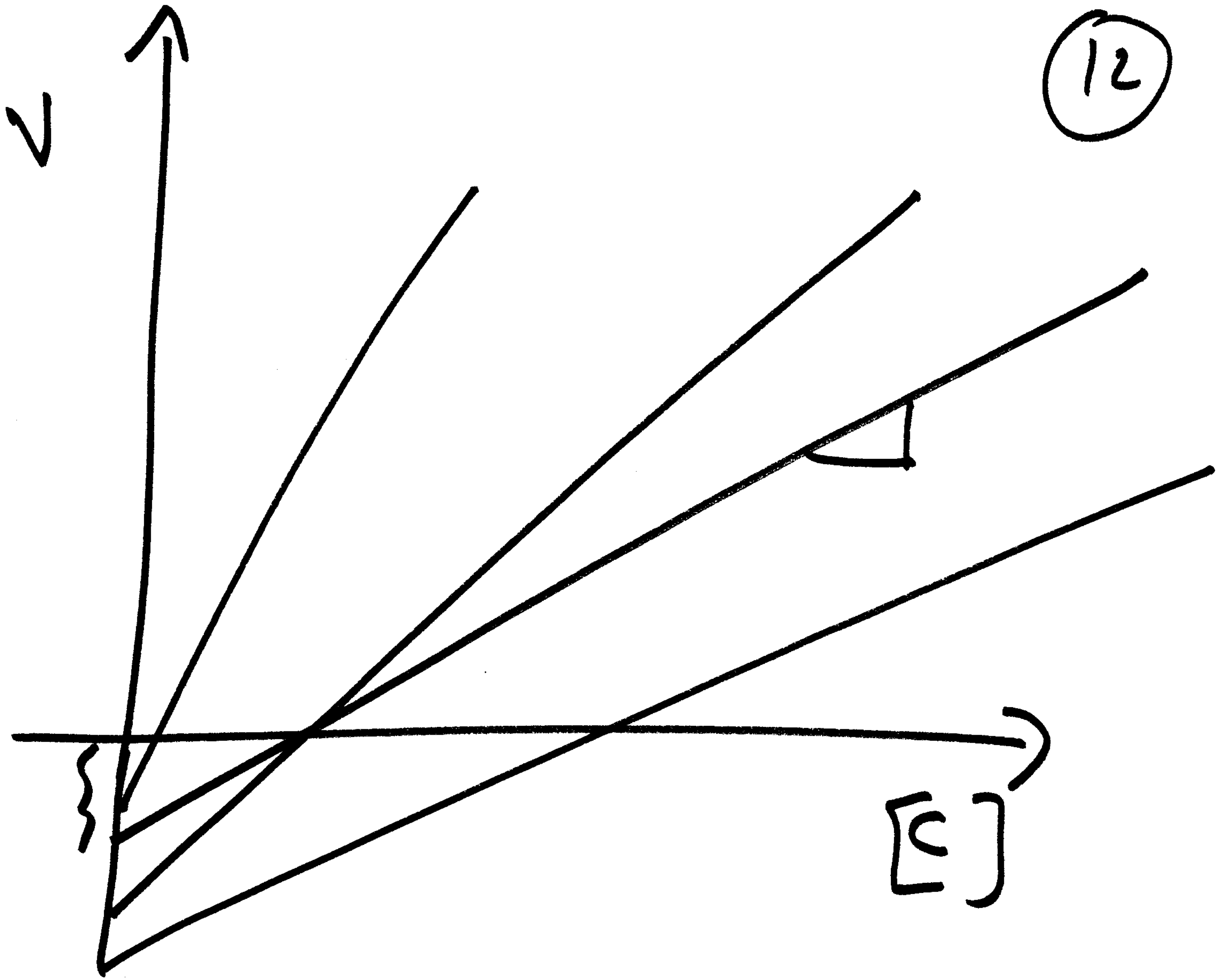
$$\frac{dV}{dC} = \text{slope}$$




$$\boxed{\text{Slope} = k_o}$$

$$\text{Slope} = \frac{dV}{dc} = \frac{9.5 - {}^{-}1.5}{1}$$

$$= 11$$


12
V
[C]

$f : [a, b] \longrightarrow \mathbb{R}$, $f$ : 4-times differentiable on $[a,b]$

$f^{(4)}(x)$ : cont$^s$ on $[a,b]$.

$$a = t_0 < t_1 < \cdots < t_n = b.$$

$$t_{i+1} - t_i = h = \frac{b-a}{n}.$$

$$X_n = \{ \cancel{b} : g \in C^1[a,b] : g|_{[t_i, t_{i+1}]} \text{ poly. of degree} \le 3 \}.$$

dimension of $X_n = 4n - 2(n-1)$

$= 2n + 2.$

$$\frac{1}{|\vec{r}-\vec{r}'|} =$$