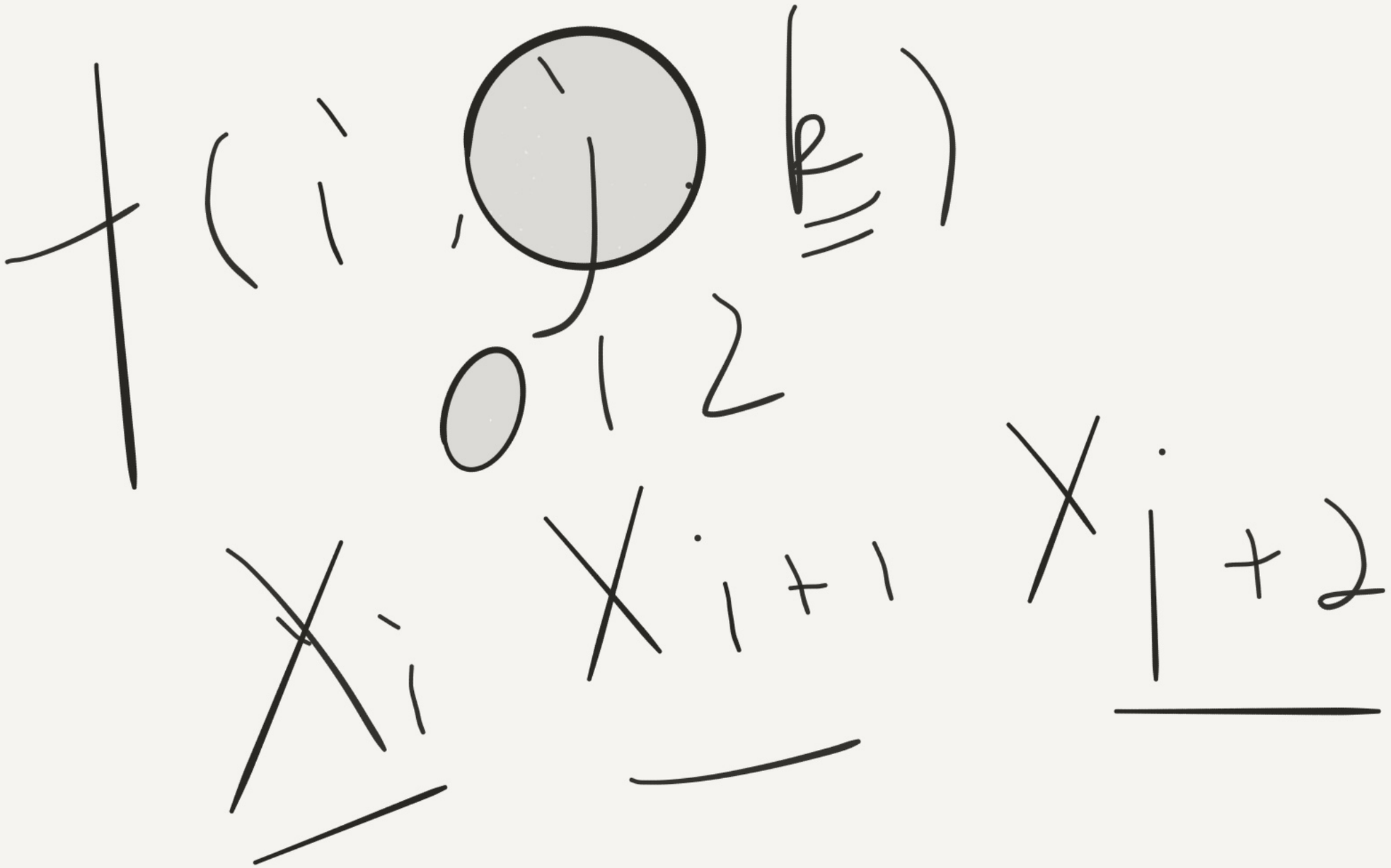
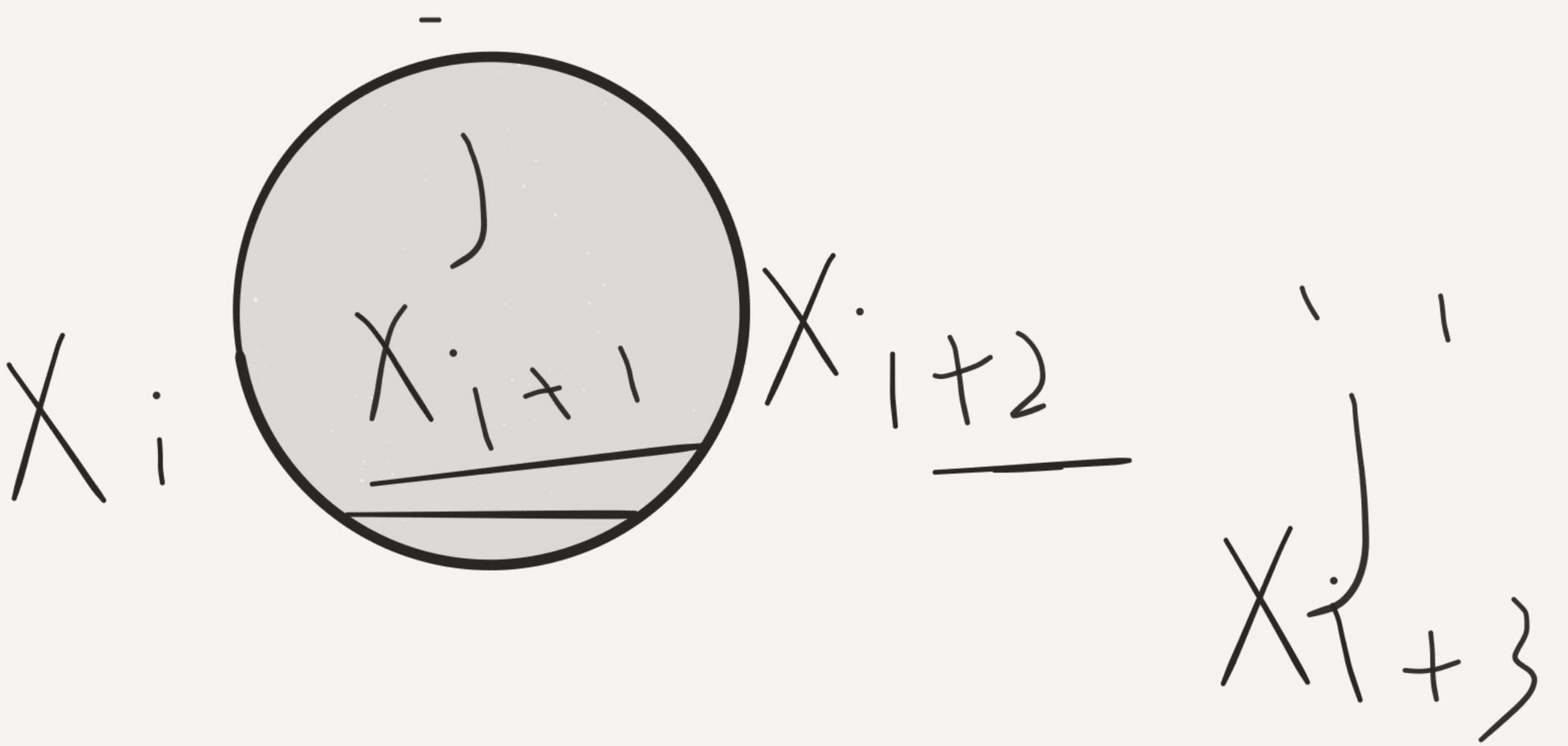
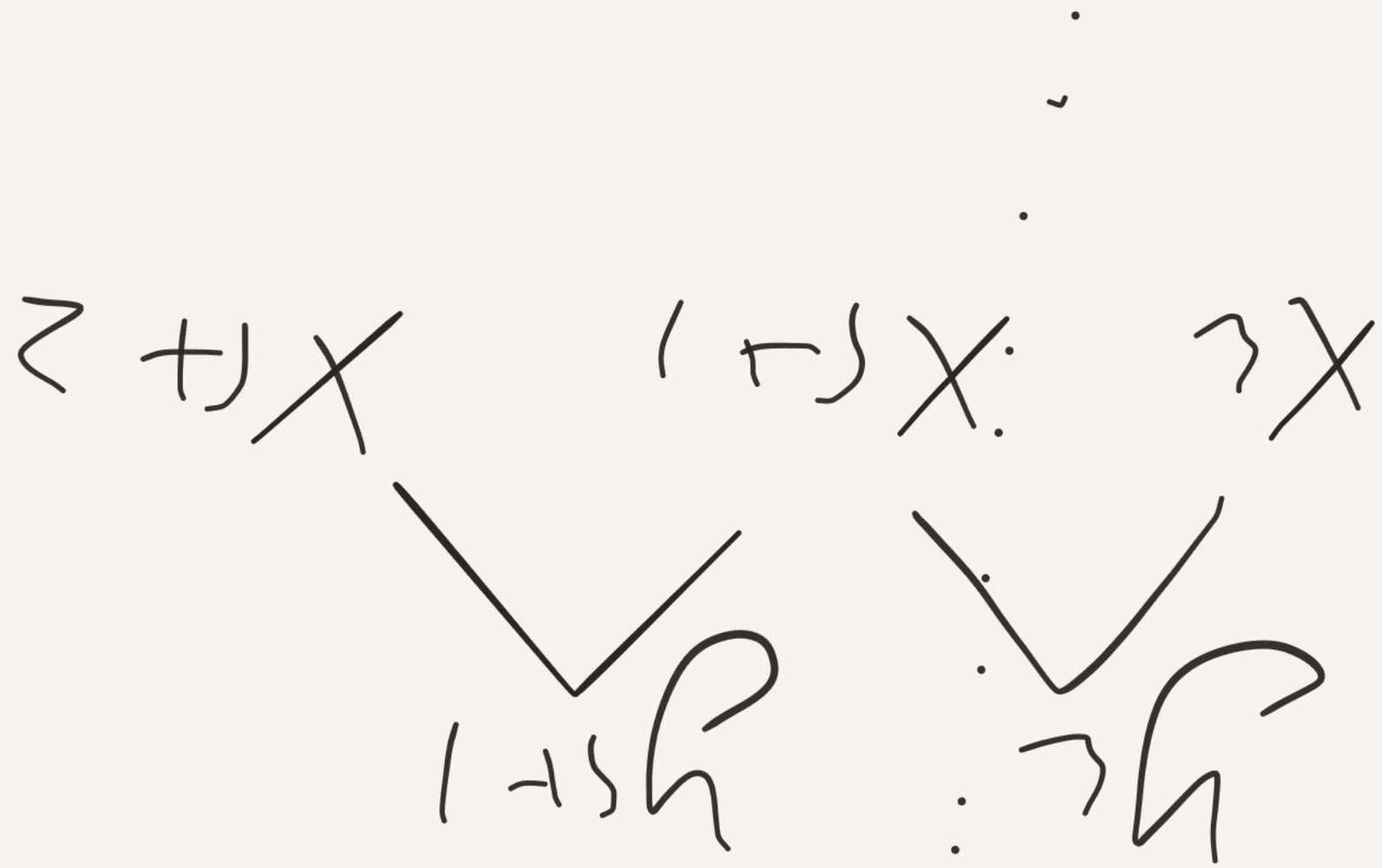


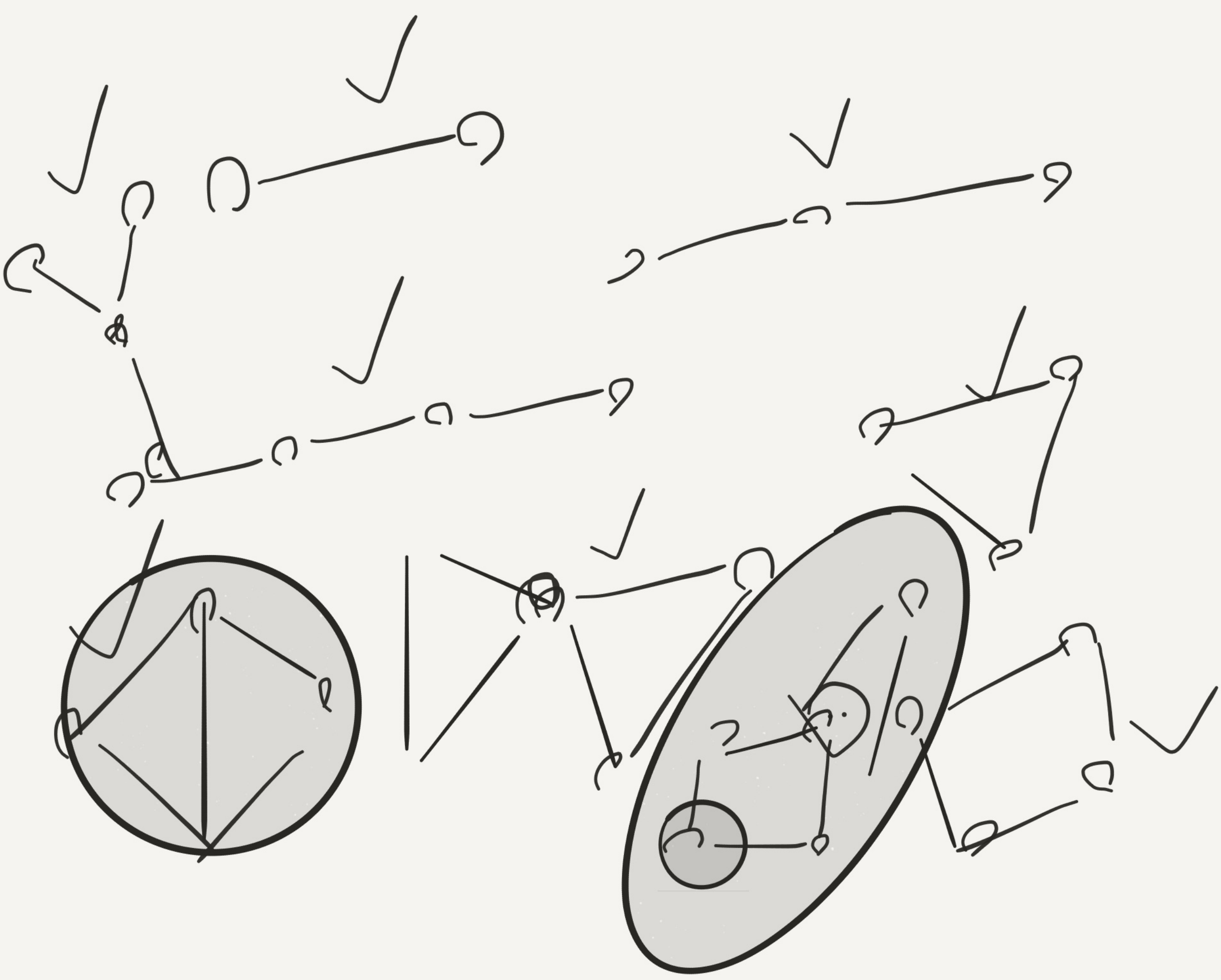


$$y_i = \max(x_i, x_{i+1})$$

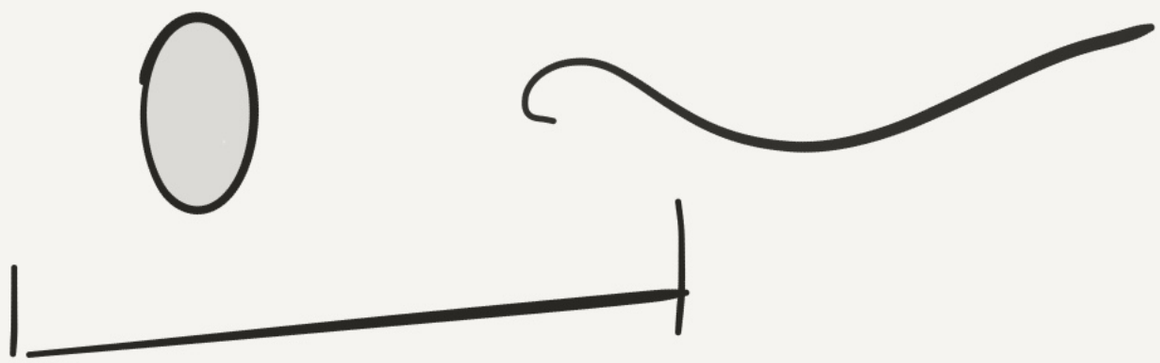
$$y_1 \dots y_{n-1}$$

هدف: y_i y_{i+1}





$p \qquad 2^k \pmod 4$



$\{i \cdot a_i$

$(n+1 \text{lcm}(1 \ldots$

$n \cdot \text{lcm}($ $)$

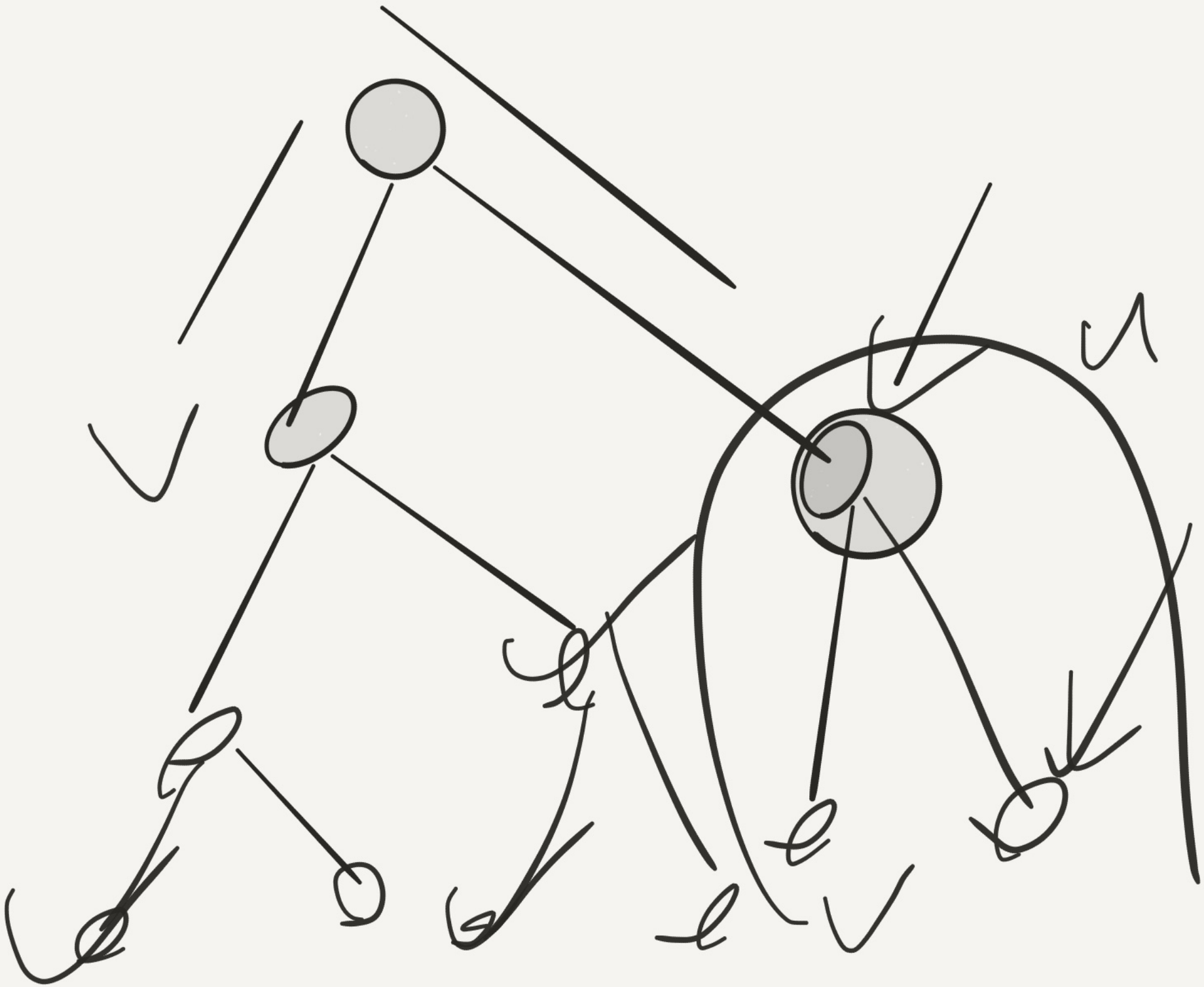
$$X_1 X_2 \cdots X_n$$

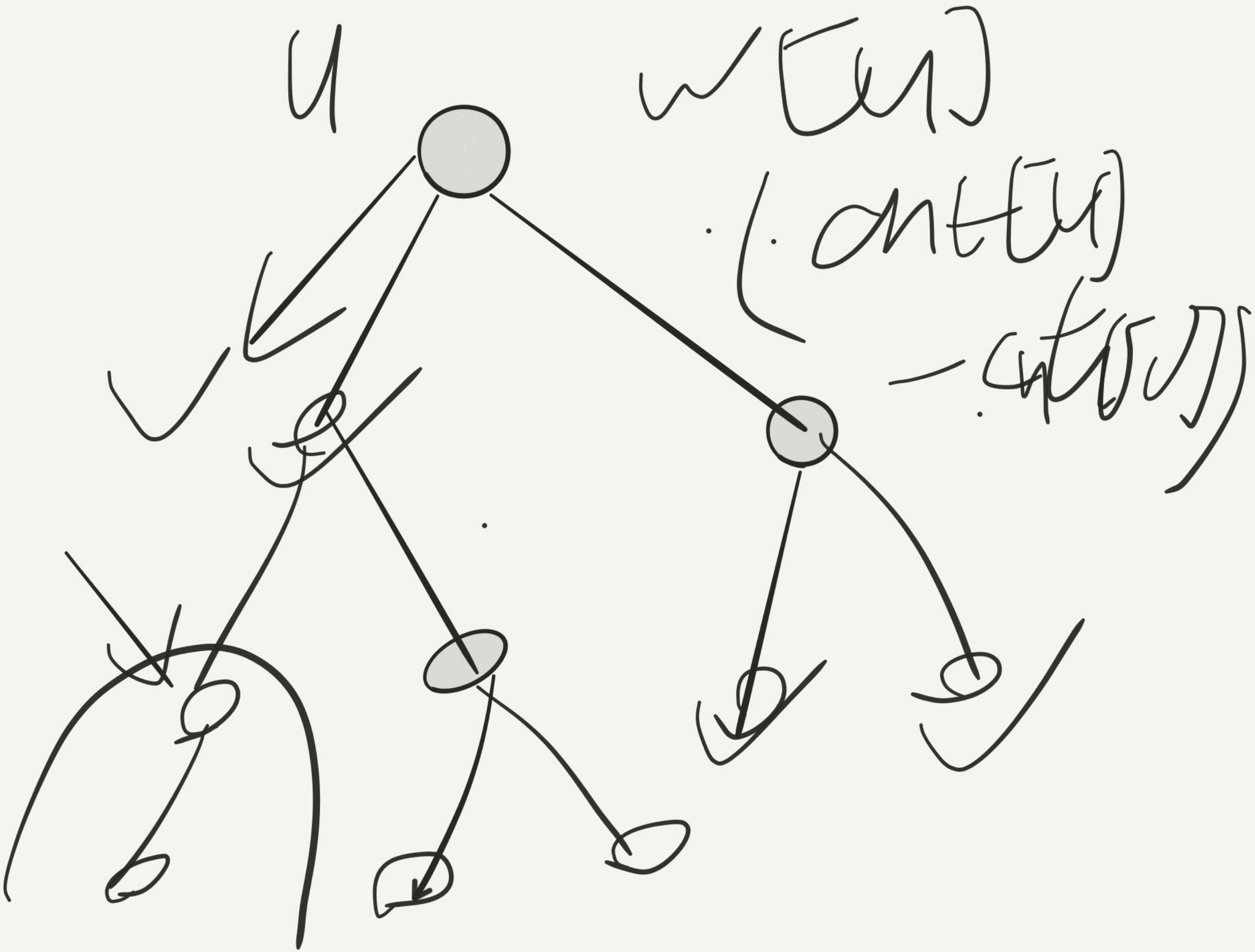
$$\sum i \cdot X_i$$

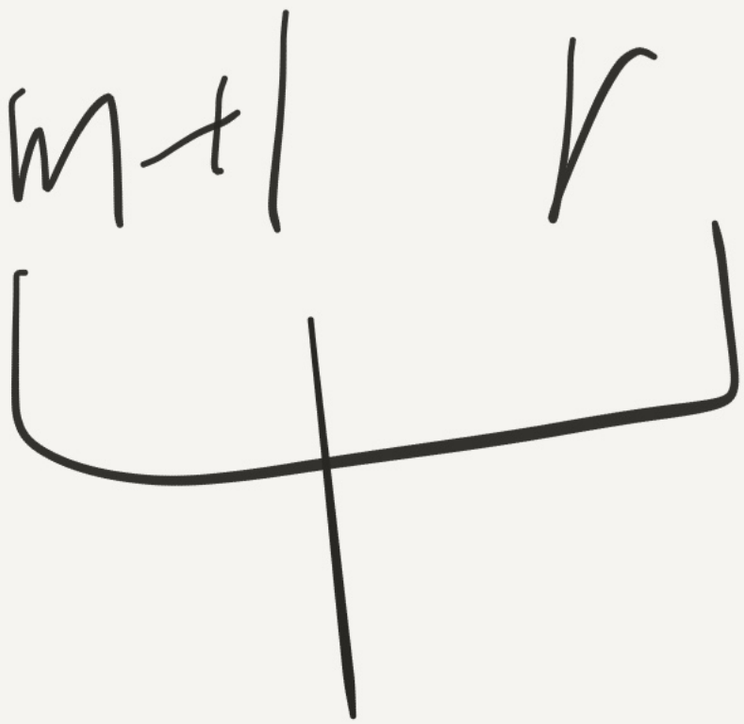
$$= \sum i \cdot \left(\frac{LCM}{i} \cdot k_i + r_i \right)$$

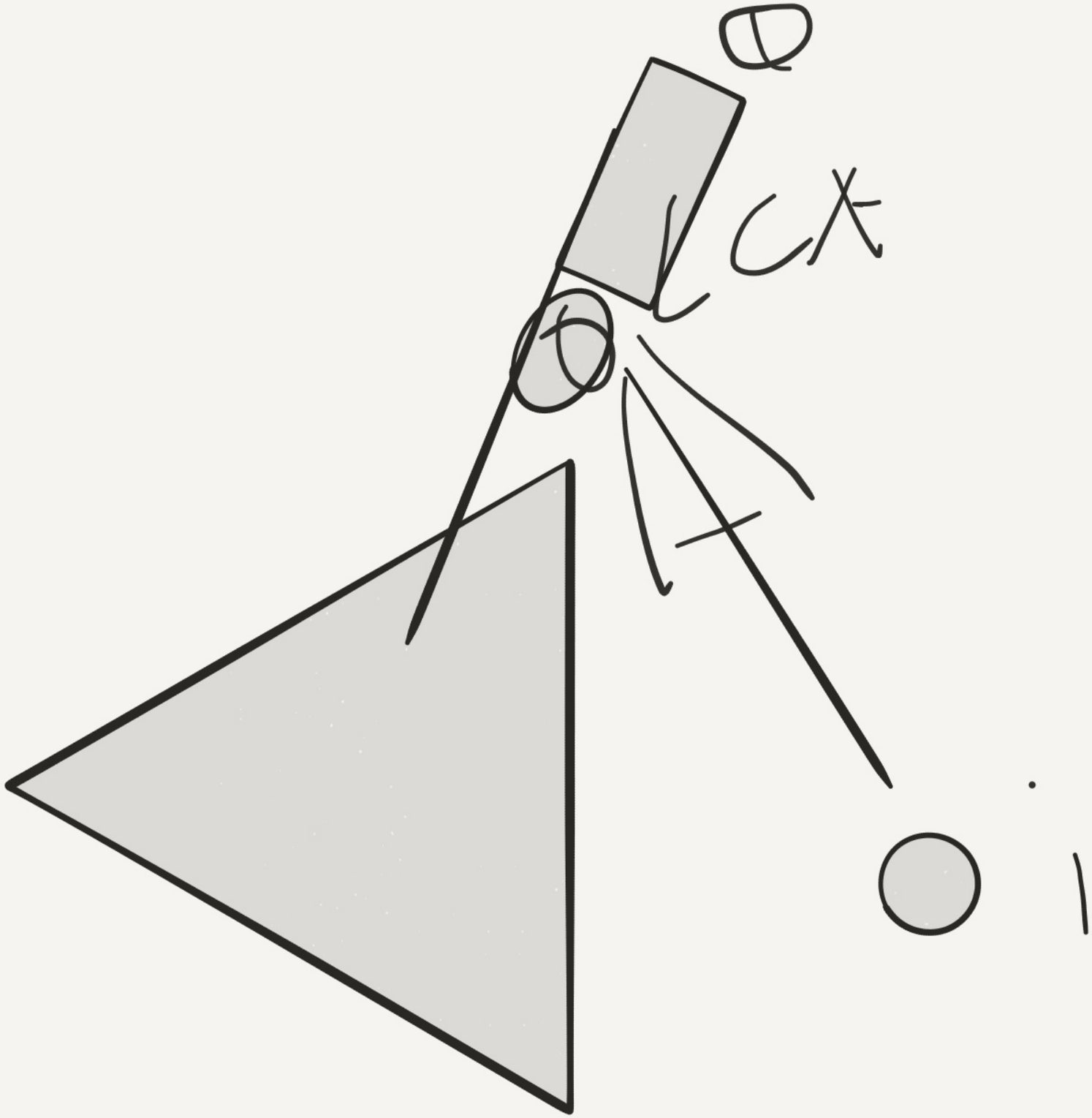
$$= \sum LCM \cdot k_i + \sum i \cdot r_i$$

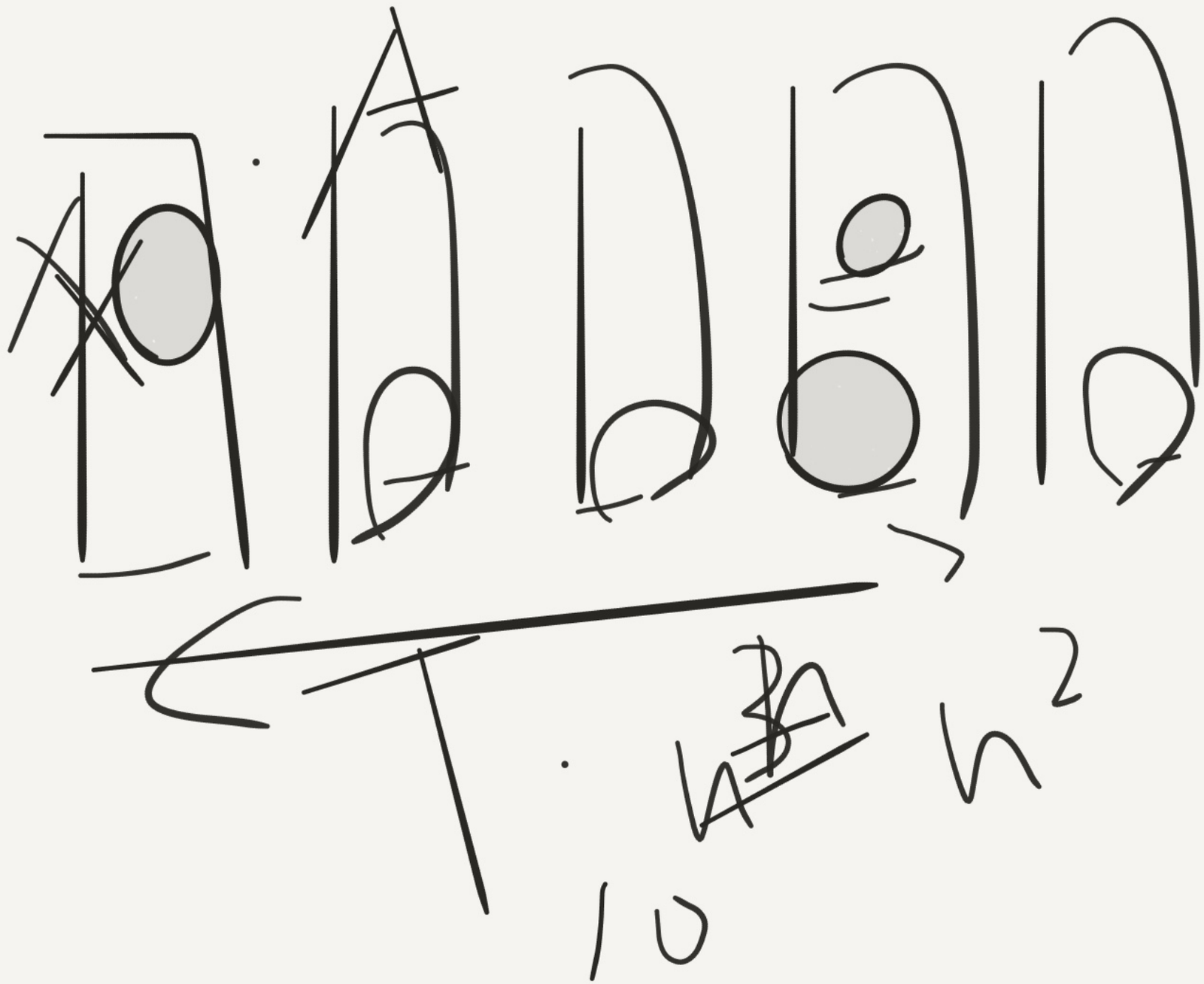
$$0 \leq$$

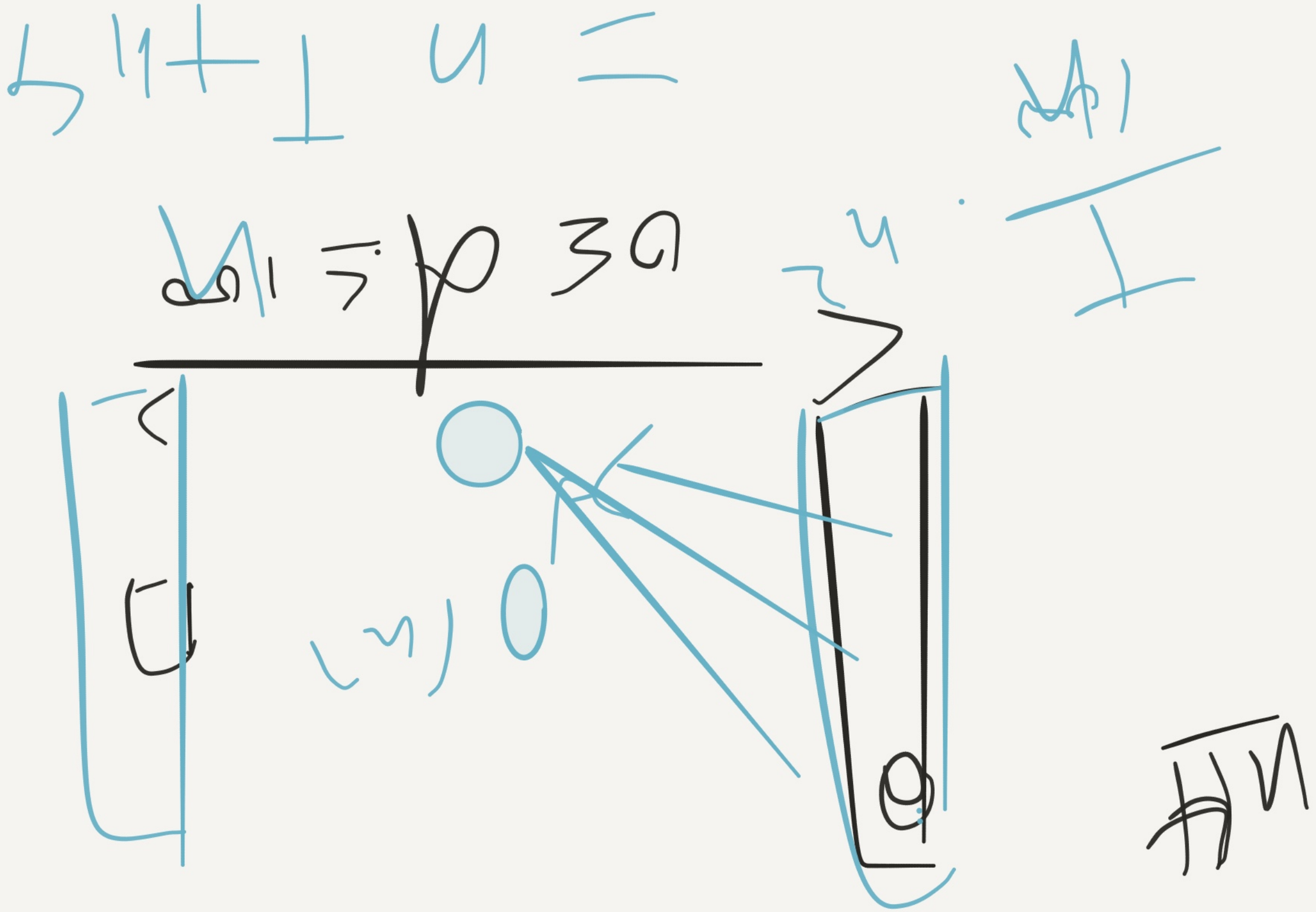












$\sim \int_{9} x a = \int_{9}^{7}$

~~$f(x) = \lambda z - 9$~~

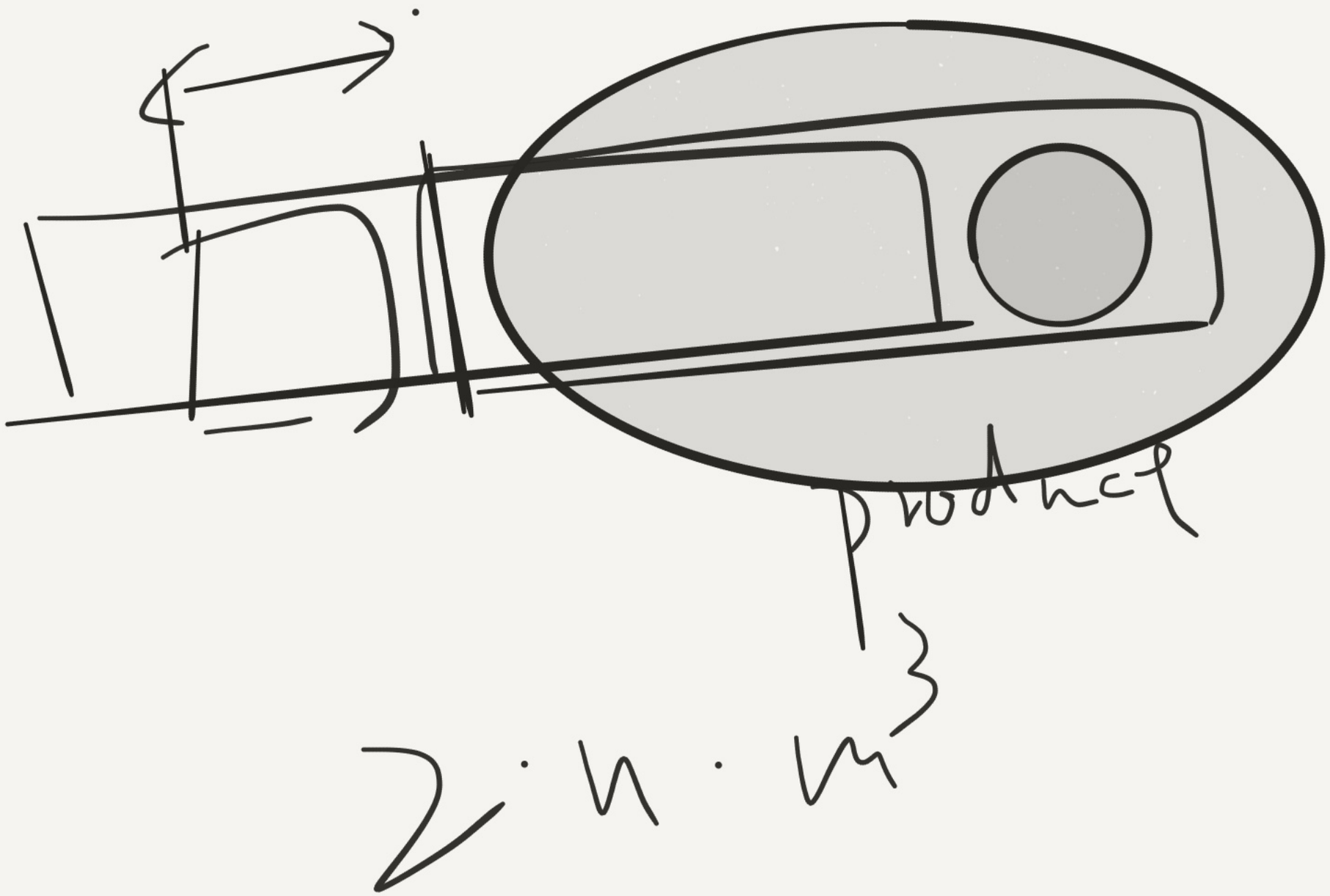
$f(x) = |\lambda z - 9|$

$f(a) \to 1$

$$\lambda^n - \sum_{i=1}^{n-1} C_i \cdot \lambda^i = 0$$

$$g(k) = \sum_{i=1}^{n} g(k-i).$$

$$= \sum C_{n-i}$$



$$dp(i,j) = dp(i-1,j-1) + \min\{x, y\}$$

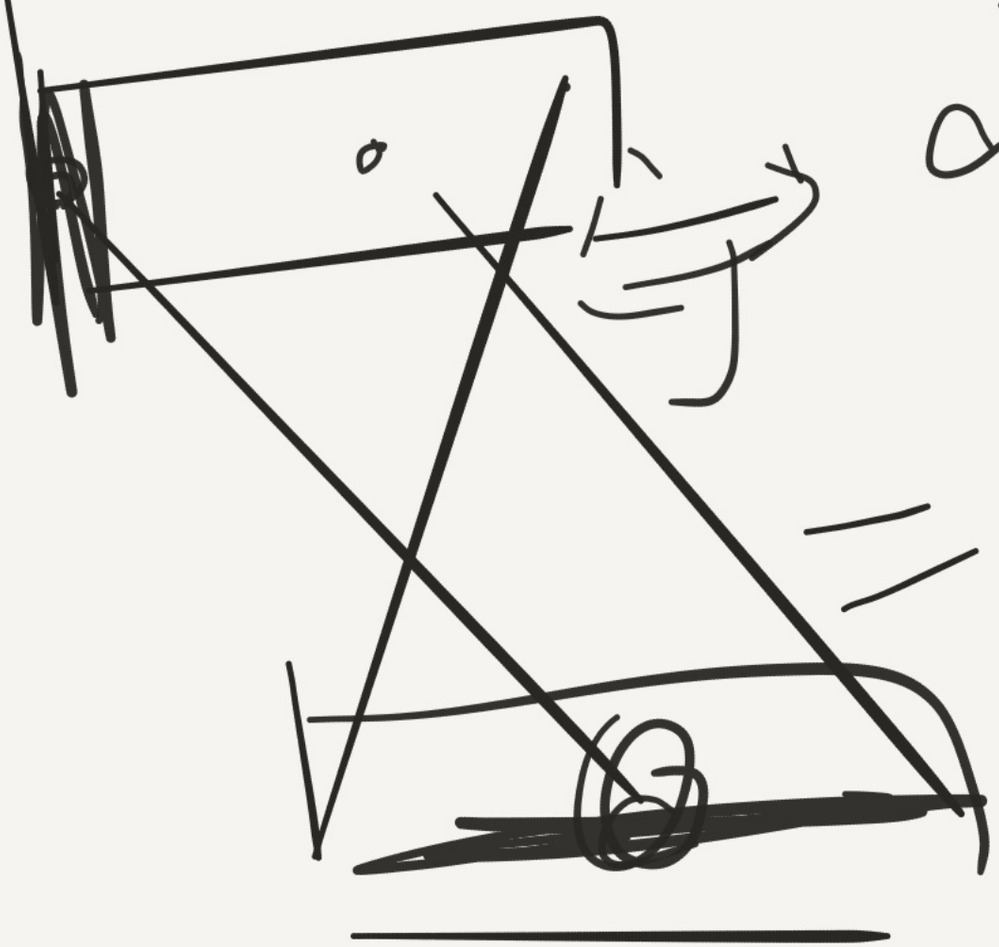
A

B

$a(i)$ $b(j)$

$\min\{a(i)-a(i'), b(j)-b(j')\}$

$$c = b(j) - b(j')$$



$$= a(i) - a(i') + c - (b(j) - b(j'))$$

$$= a(i) - a(i') - (b(j) - b(j'))$$

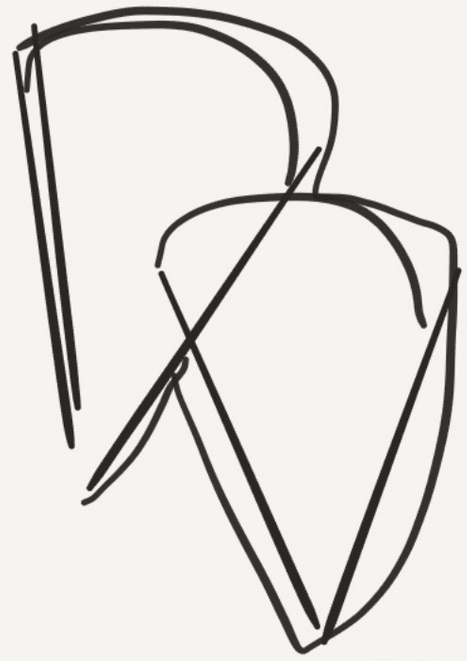
$$O(h^2 \log n)$$

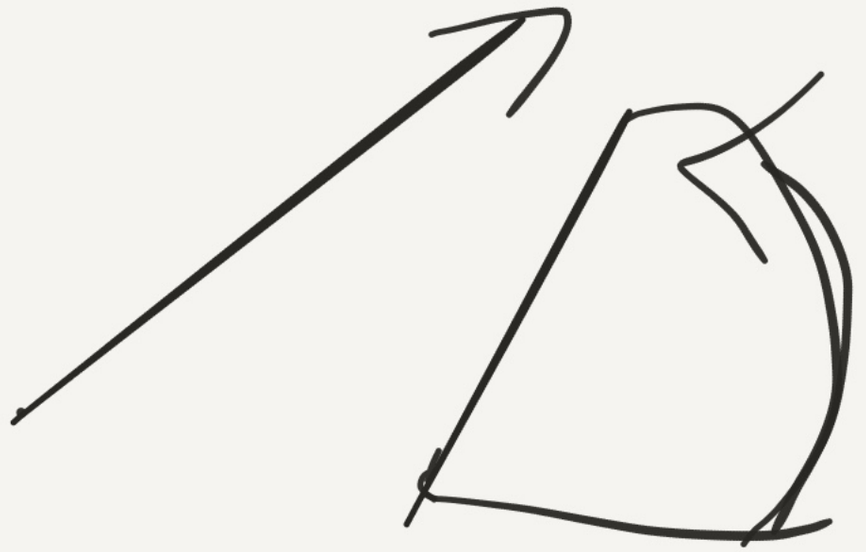
$1, 2, \ldots, i-1$, ith ?

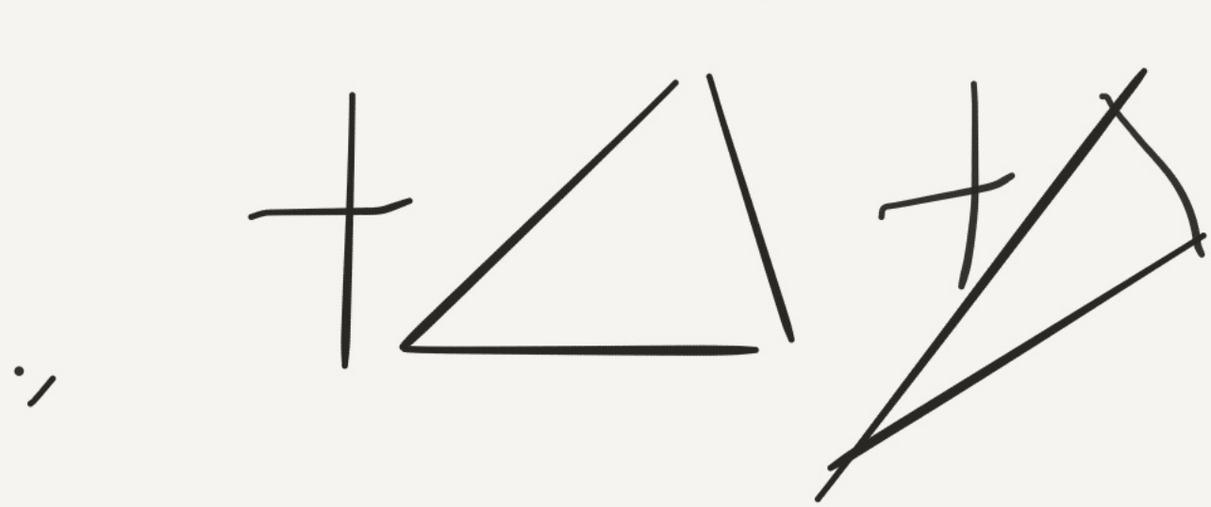
✓ $\leq$ x

$(2^x - 1)(2^y - 1)$

1 12 ...





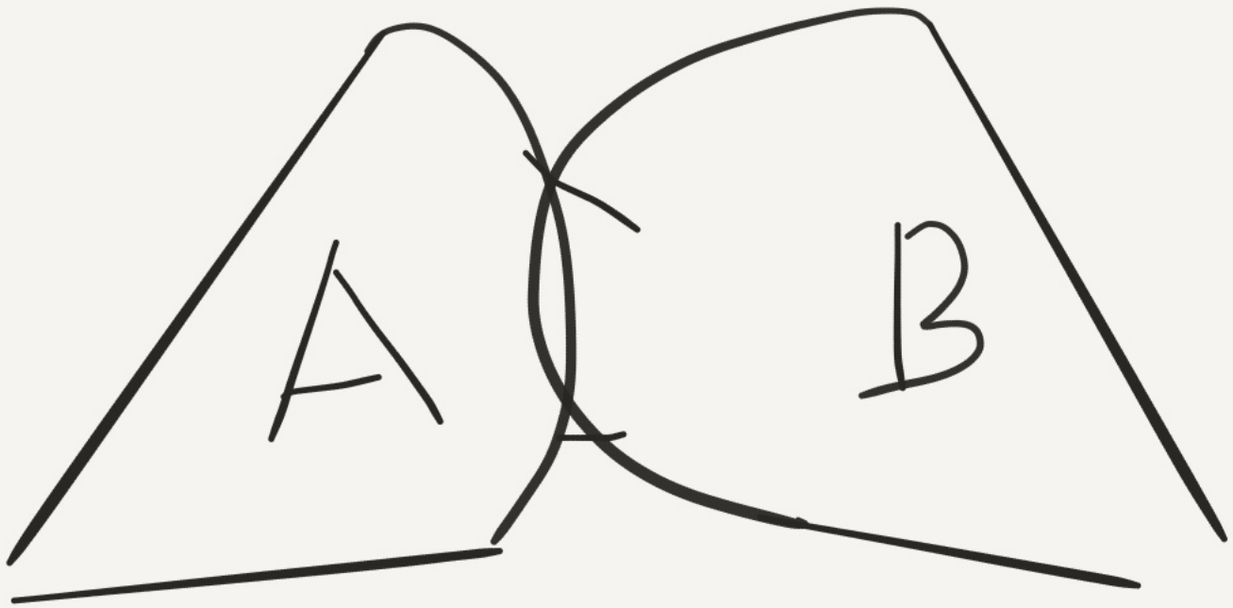


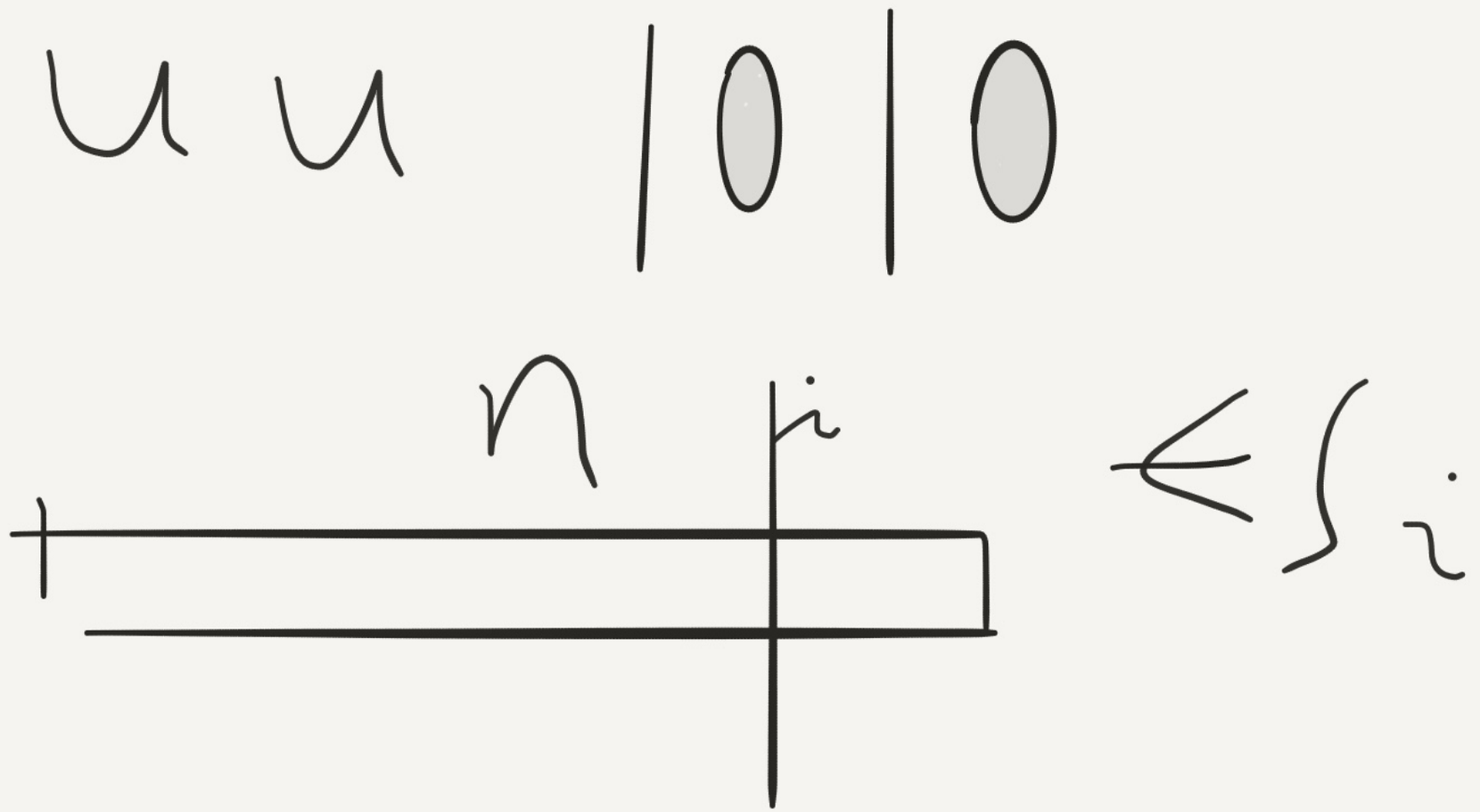
$$\iint_D \left(\frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y} \right) dx\,dy$$

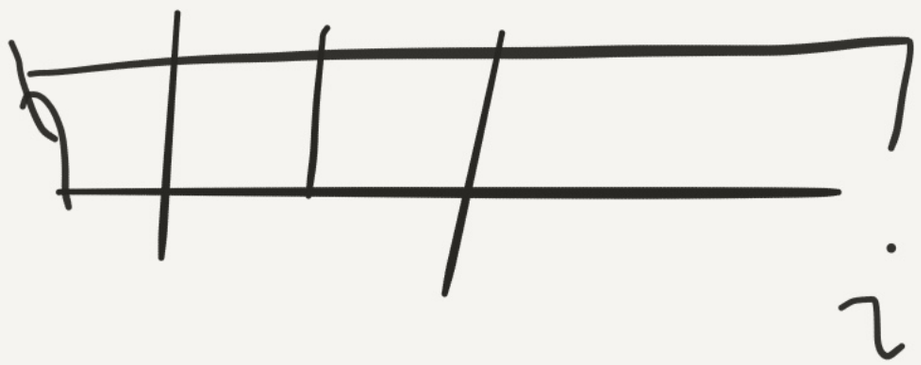
$$= \oint P\,dx + Q\,dy$$

$$\iint_D 1 \, dx\,dy$$

$P = -y \qquad Q = x$

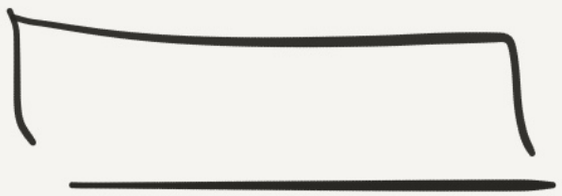

A
B





$P = \underline{\nu} \nearrow \nu$

i



fail i

$$\geq 1$$

$$2 \times 2$$

$$b_m(n) = \begin{cases} b_m(n-1) + b_m\left(\frac{n}{m}\right) \\ b_m(n-1) \end{cases}$$

$b_m(10) \quad\quad b_m(1)$

$$S_n = \sum_{i=0}^{n} a_i b_i, \quad B_n = \sum_{i=0}^{n} b_i$$

$$S_n = a_n B_n - \sum_{i=0}^{n-1} B_i (a_{i+1} - a_i)$$

$n \to \frac{n}{R}$

$$n = \sum_{i \geq 0} a_i m^i \quad (\lfloor \log_m n \rfloor)$$

$$(a_0, a_1, a_2, \ldots)$$

$dp_{i,j} \geq dp_{i-1,j-t} + m^2$

$t \geq 0$

$dp_{[l,r],h}$ 可以 $h \pmod{m^2}$

$$j = \underbrace{j'}_{\sim} m^2 + (n \bmod m^2)$$

$$\alpha_{p_i, j'+\cdots} = \sum_{t>0} \alpha_{p_{i-1}, j'm+\cdots - tm}$$

$$(j'-t)m$$

$$dp_{i-1,j'm+r+(h \bmod m^{i-1})}$$

$$dp_{0,0}+0=1$$

$$dp_i \longleftarrow \sum dp_{i-1} \qquad deg = i$$

~~$deg(dp_i) \cdot deg(dp_{i-1})$~~

$$dp_{i+1}[j] = \sum_{t=0}^{} a_{t,j}$$

$$f(0), \cdots f(\deg - 1)$$

$$f(m) \quad 0 (\deg)$$

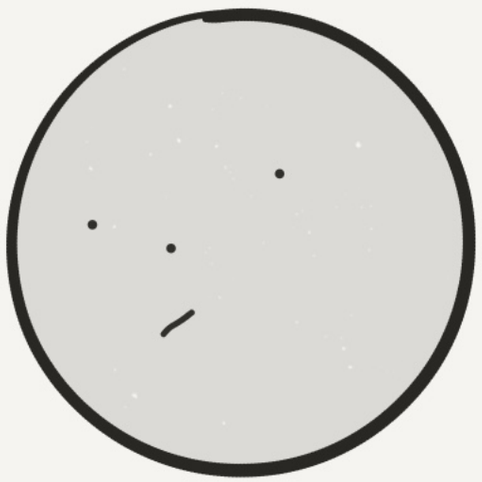
$dp_i \leftarrow dp_{i-1}$

$(i+1)$ i

$O(\log_m^3 n)$

$$\sum_{n=1}^{\infty} b_m(n) = \prod_{p} \frac{1}{(1-p^{-m})^{b}}$$

$$\zeta_m^k(n) \qquad t \geq 0 \qquad \frac{1}{1-x}$$



C_q 、 l_q / $l_{\geq q}$

$$l_{\geq q} = C_q - C_{q+1}$$

$l \geq q$ L $x \in L$

$p - q + 1$ q-sets q

$p - q$ $(q+1)$-sets

$$\sum_{x \in L} 1 = \frac{\#(C_q - C_{q-1})}{C_q} - \frac{\#(C_{q+1})}{C_{q+1}}$$

(x,y) (i,j)

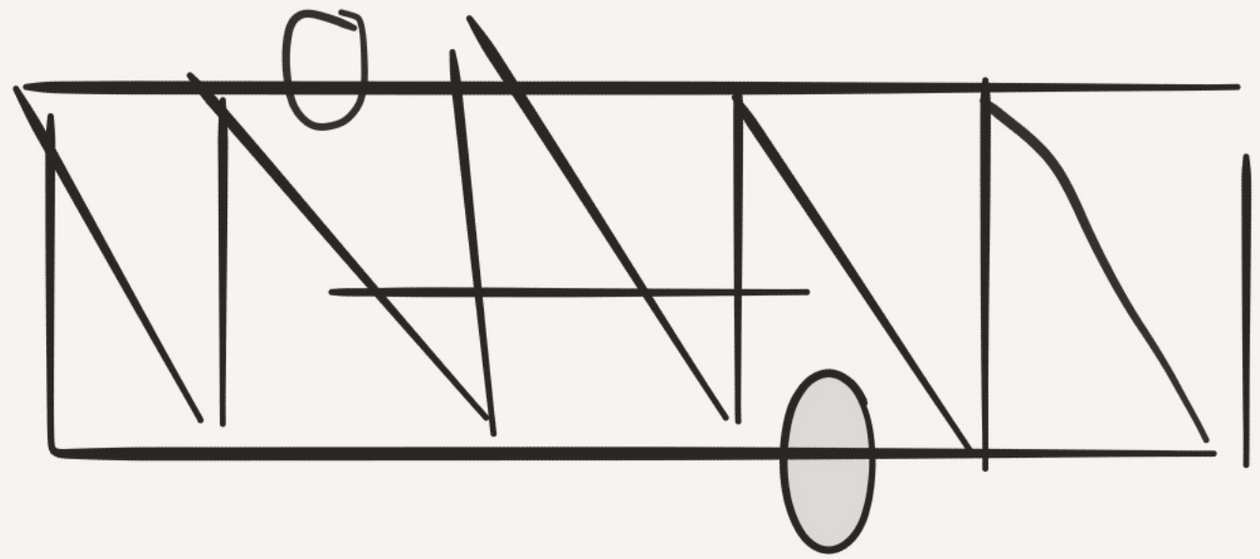
$x+y+i+j \leq n+1$

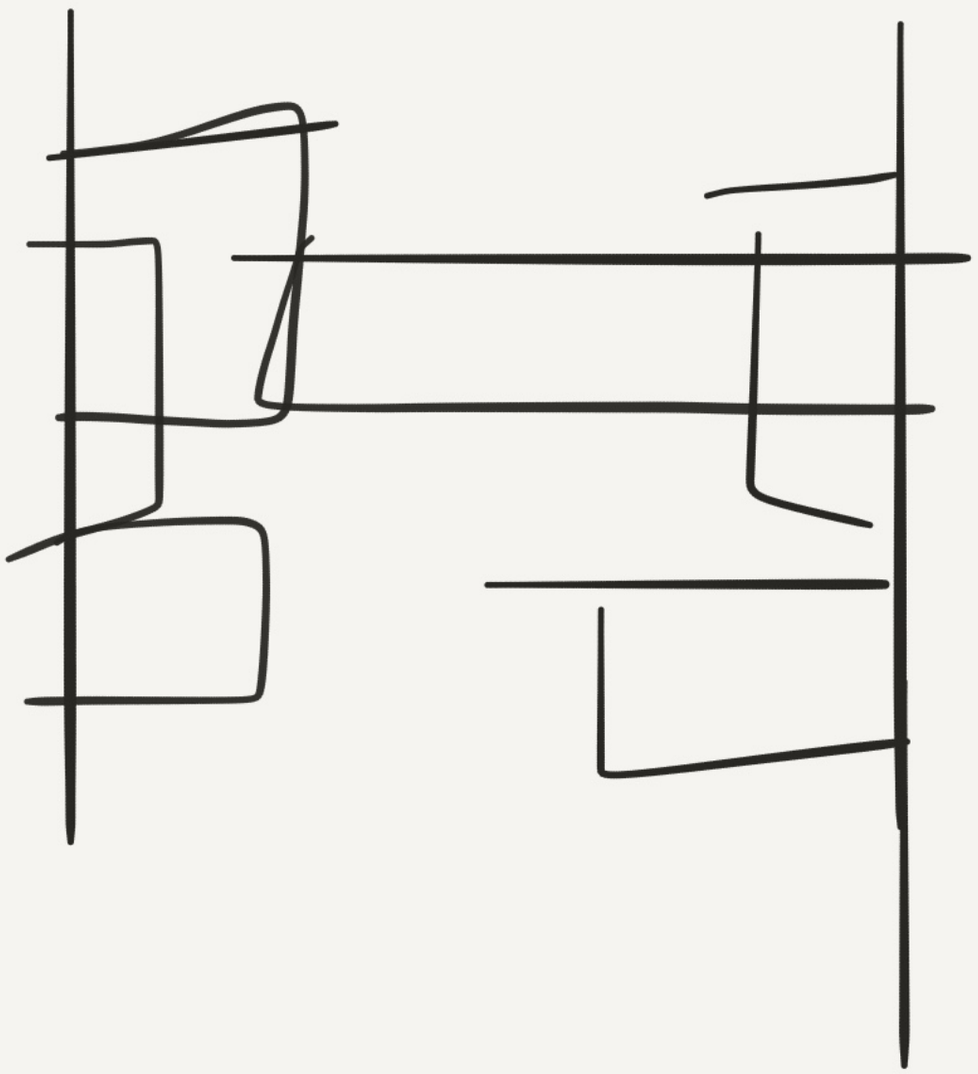
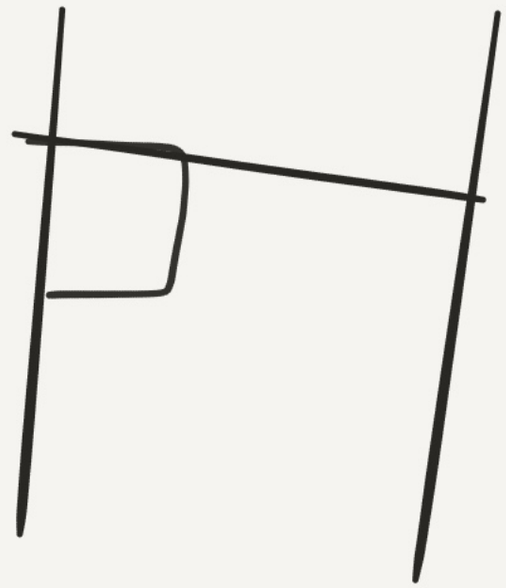
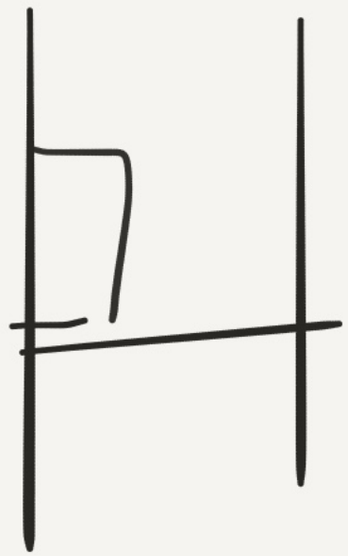
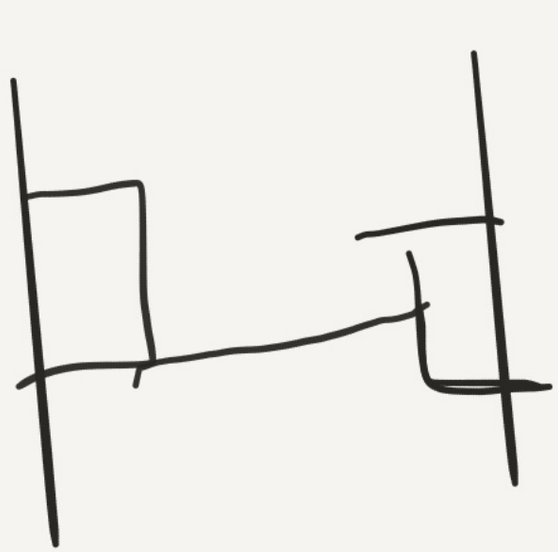
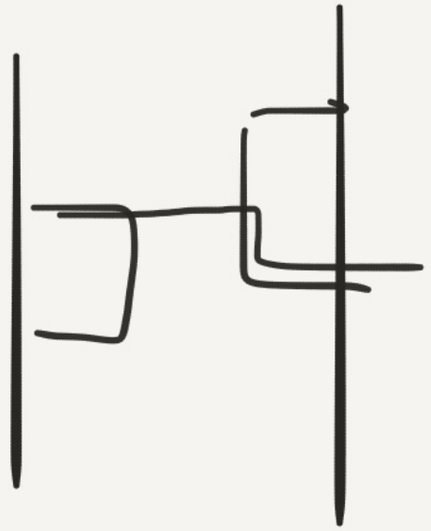
$g(i,j) = q-1$ $\quad \frac{n}{d} \quad d$

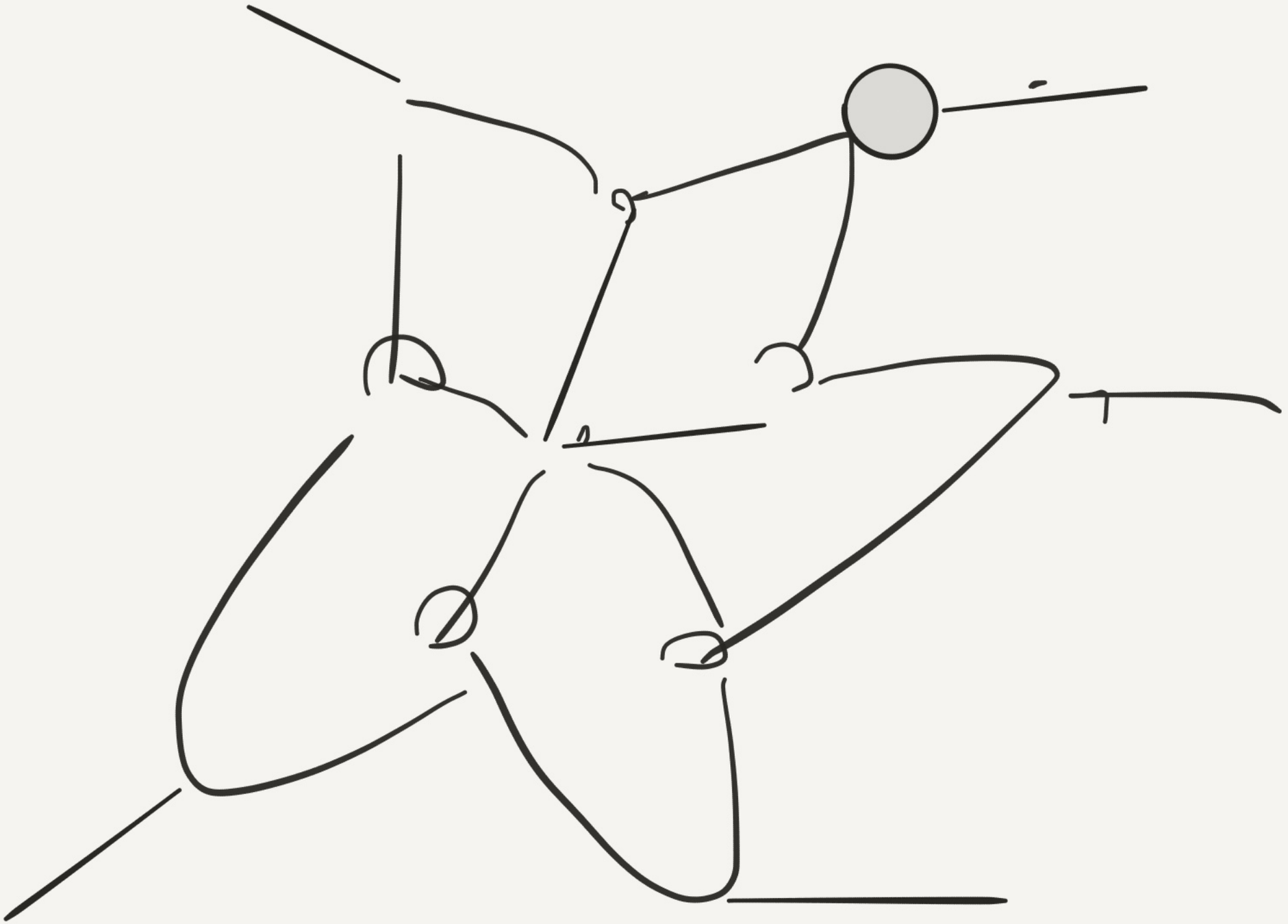
$\sum_{d=1}^{\cdot} \sum_{i=1}^{\cdot} [(i,d)=q$

$$3\sum_{i=1}^{\frac{n-1}{q-1}} \varphi(i)\Big(g(n-(q-1)i) - g(n-iq)\Big)$$

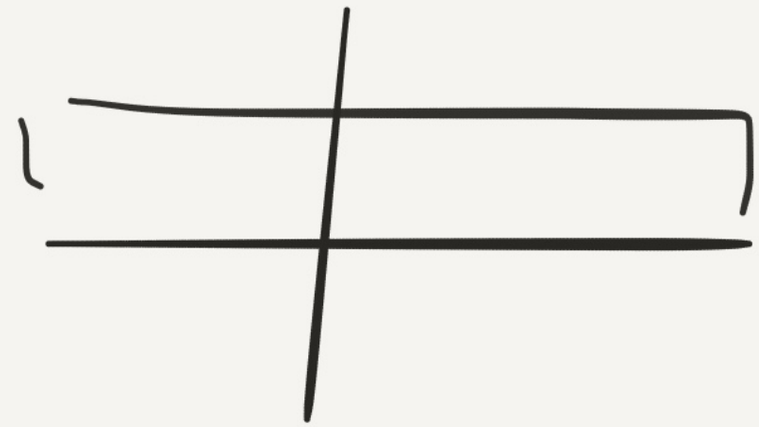
$$g(n)=\frac{n(n+1)}{2}$$





1234



21xx

41xx

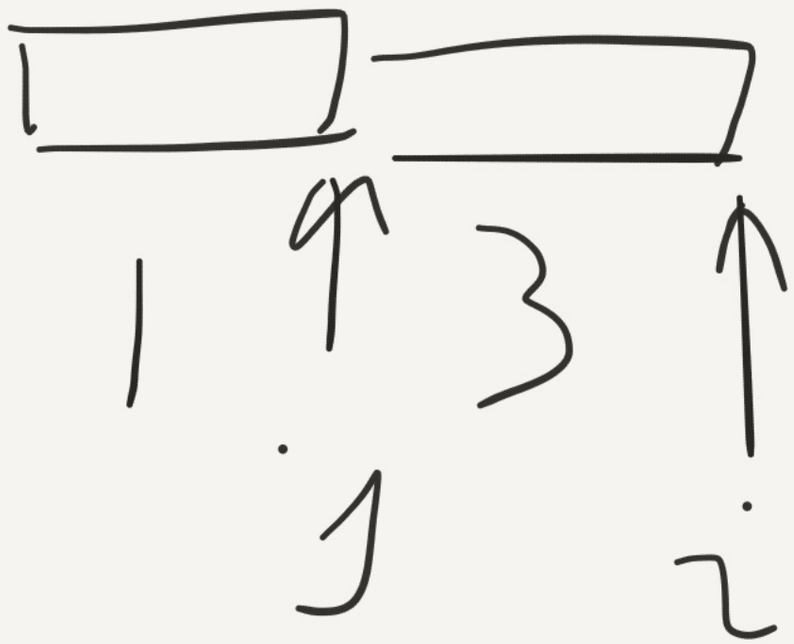
13|24

31xx

1324

3 1 2 4

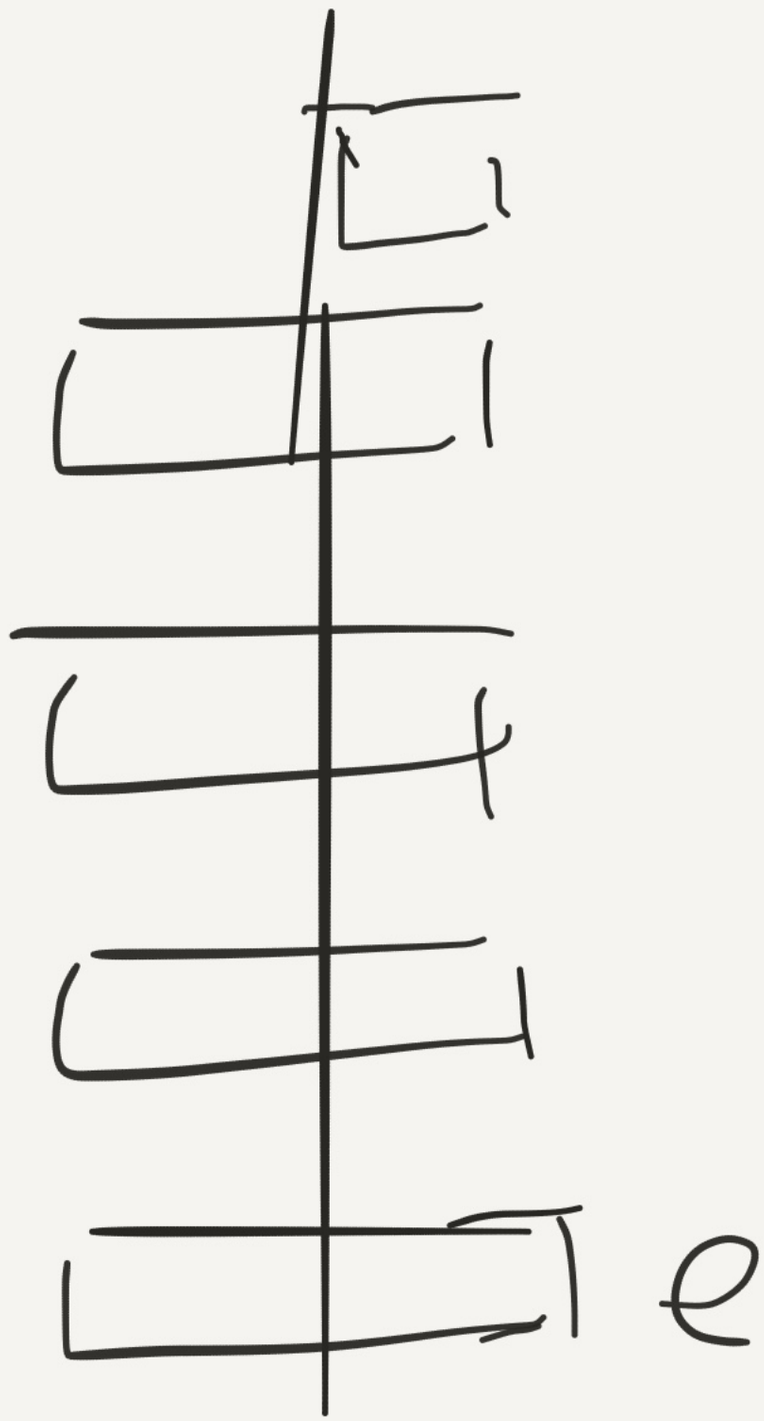
3142

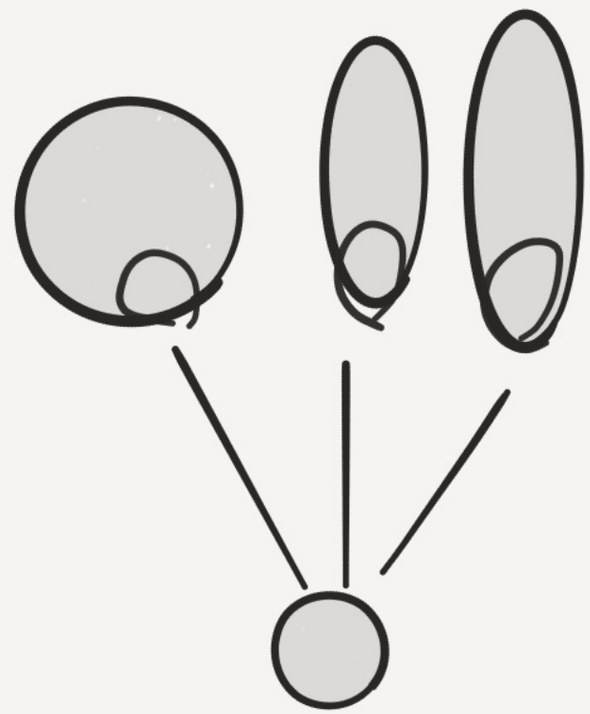


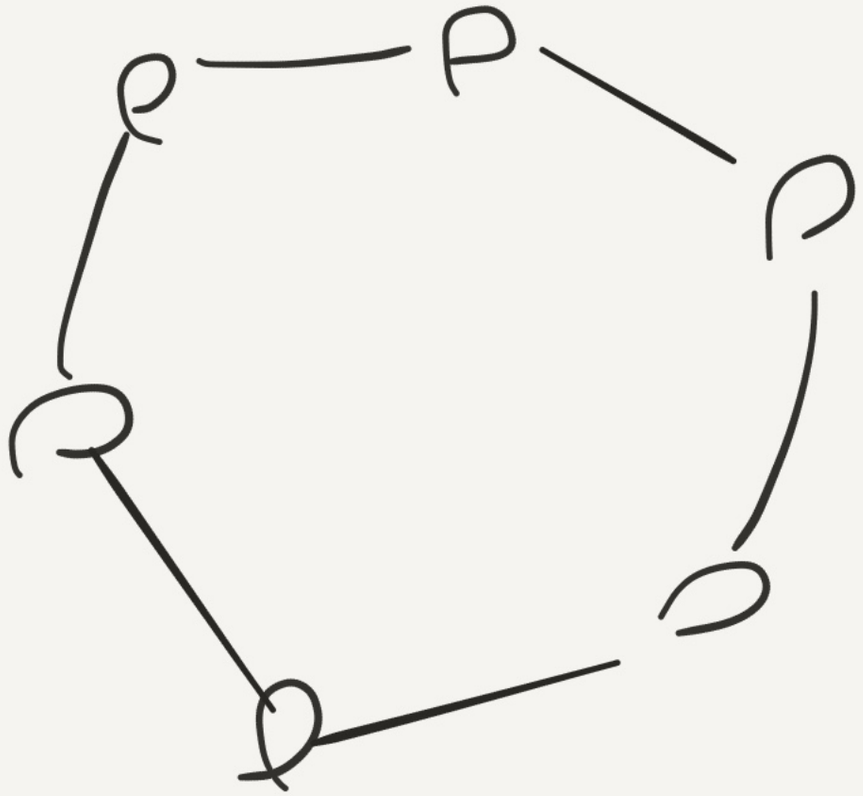
$T = A * B \qquad n \cdot d(n)$

$B = m, \qquad \sum d$

d_n


e

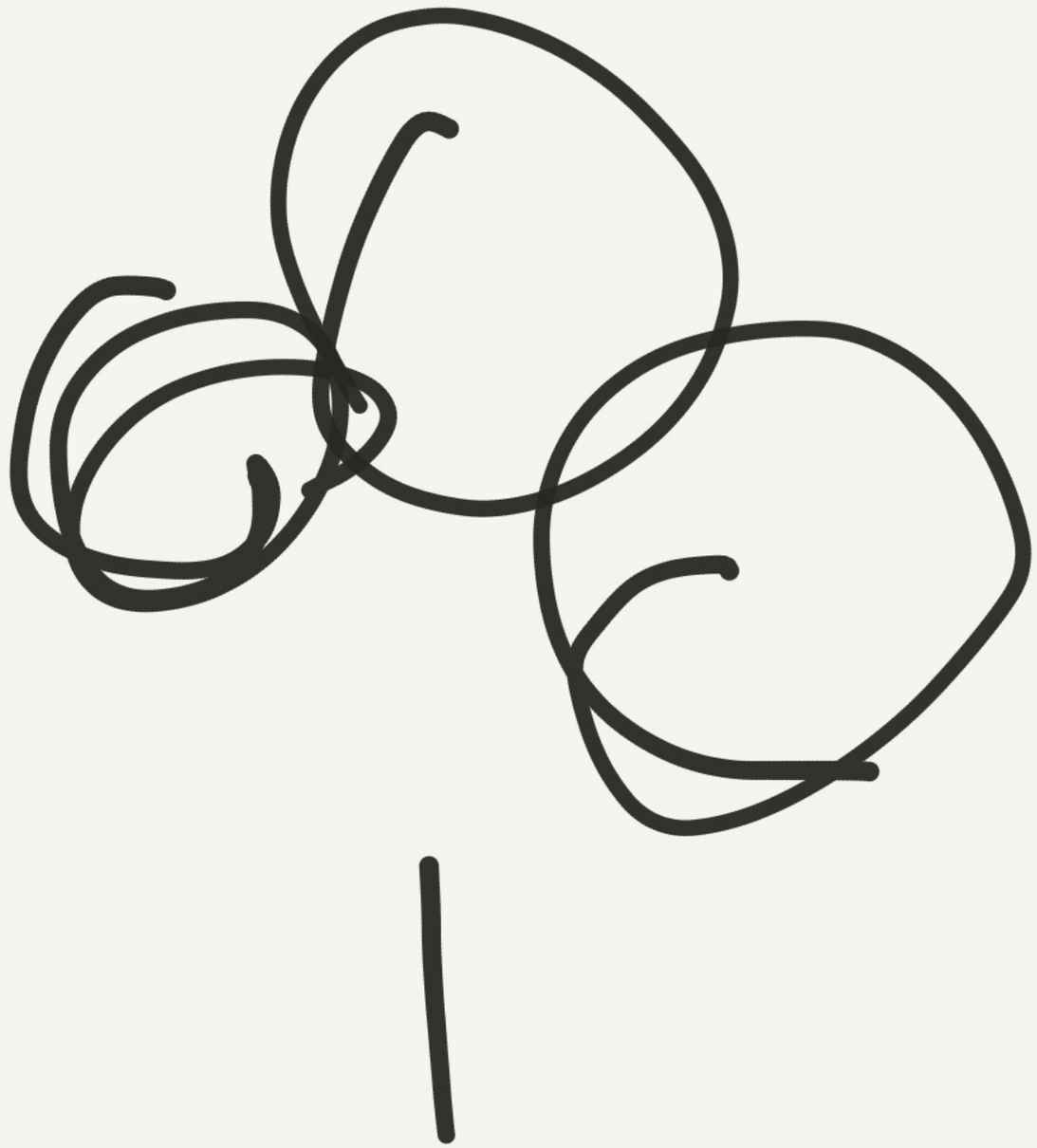




$$(i, i + \frac{n}{2})$$

$$j = 2, \left\lfloor \frac{k}{2} \right\rfloor$$

$$(i, -i + j)$$



S(x)

a

n

T(x) S(x)

1 a

T(x)

$$\sum_{t=0}^{\infty} p_t = \sum_{S \neq \emptyset} -(-1)^{|S|} p_{S,\#}$$

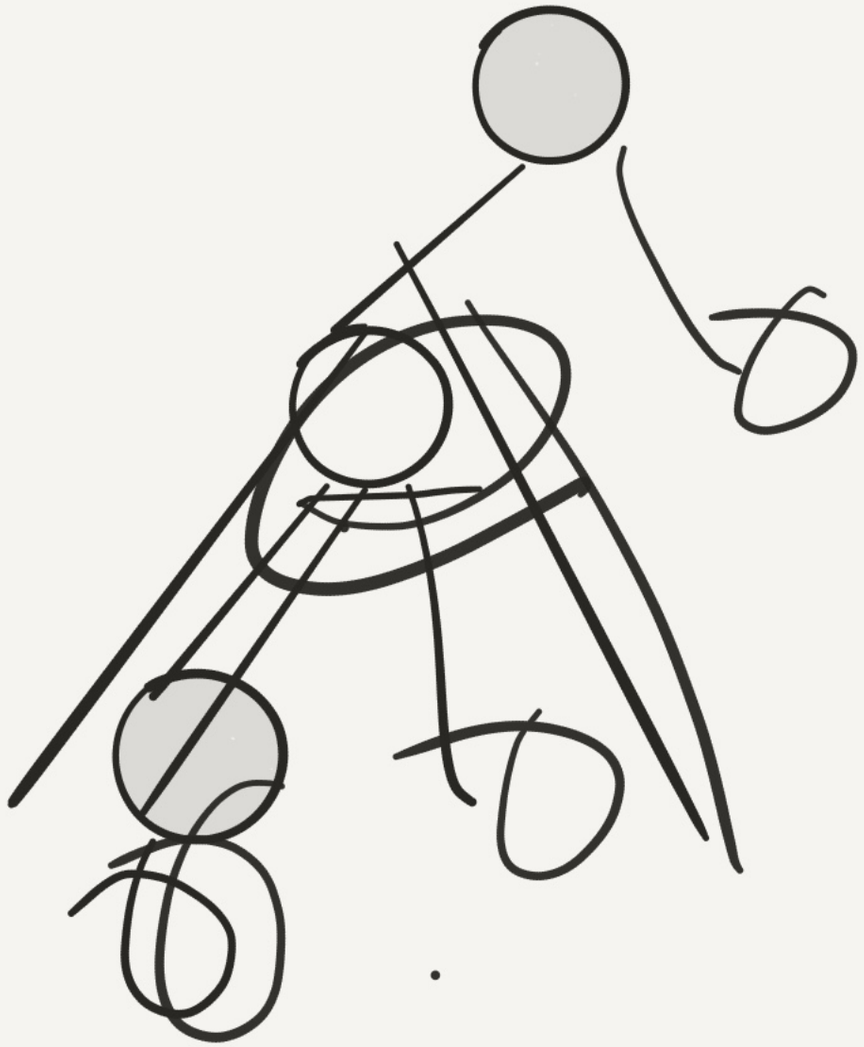
$$\#t^{-1}(S)$$

$$p_{s,t} = \left(\frac{n - |\pi^{-1}(s)|}{n}\right)^t$$

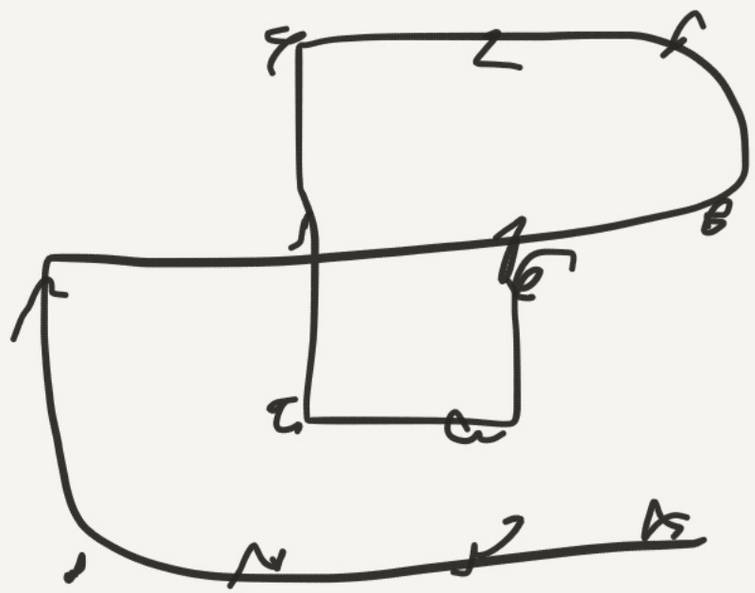
$$\approx \sum_{t=0}^{\infty} p_{s,t} - \frac{n}{n - |\pi^{-1}(s)|}$$

$$= -(-1)^{|s|}$$

$$\sum_{k} |\pi^{-1}(s)| = k_2$$

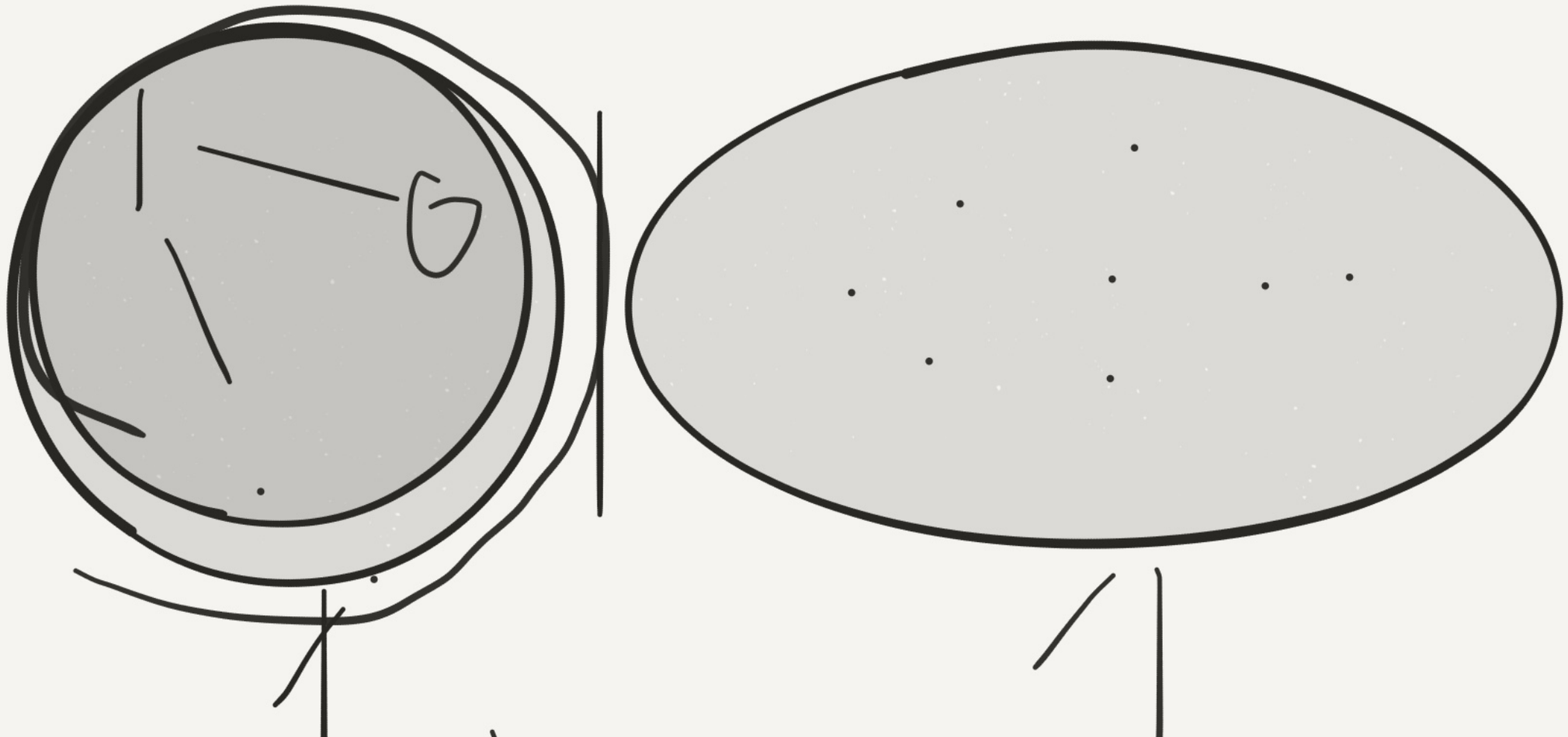


$f[i][j][d]$



$$2^{\frac{n(n-1)}{2}} = f[n]$$

$$g[n] = f[n] - 1$$



$g[k]$ $f[n-k]$

$\therefore C(n-1, k-1)$

$$g[n] = f[n] - \sum_{k=1}^{n-1} g[k]\, f[n-k]$$

$$((n-1, k-1))$$

$$g_0(t) = f_0(t) - \sum_{k=2}^{t-2} g_0(k) \cdot f_0(t-k)$$

$f(t)$ $g(t)$

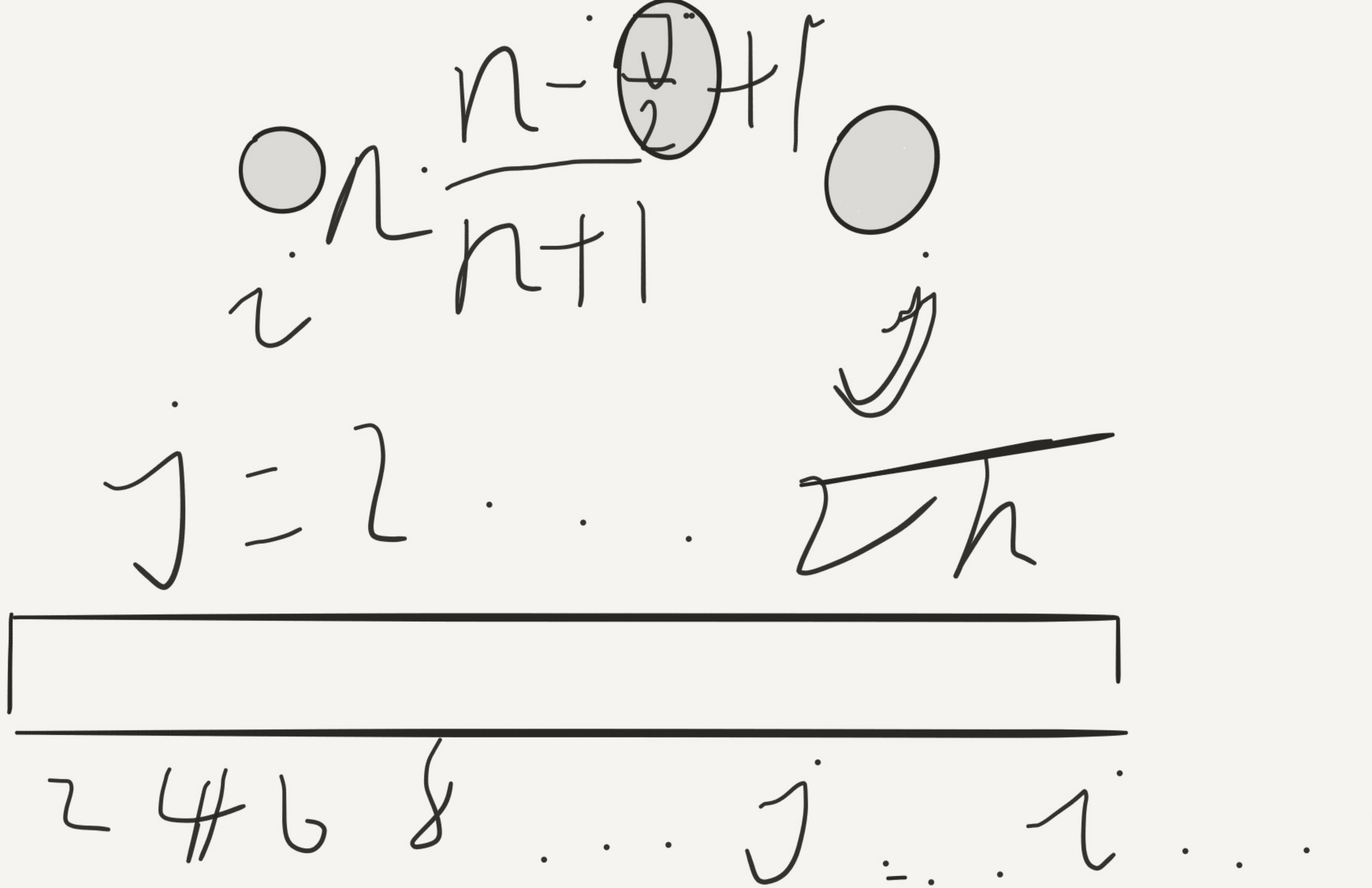
$$\sum_j g(t) = \sum_j f(t)$$

$$p \qquad p$$

$$- \sum_k g(k) \cdot$$

$$5 - 4 \quad 1 \quad 3 \quad 6 \; 2$$

$$5 \; 2 \; 1 \; 3 \; 6 \; 4$$



$n \cdot \frac{n - \frac{j}{2} + 1}{n+1}$
i
j
$j = 2 \ldots 2n$
2 4 6 8 . . . j . . . i . . .

$$an^2+bn+c$$

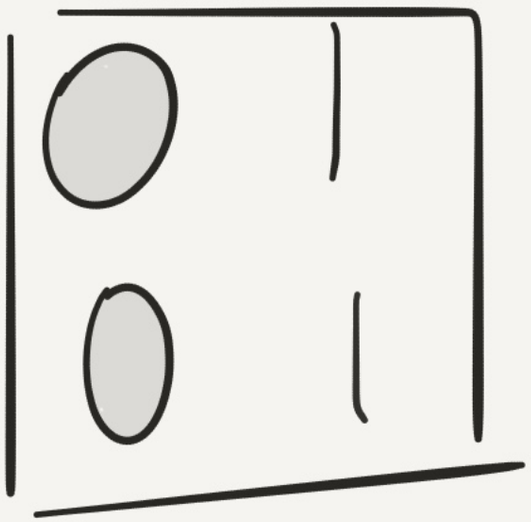
$f(x)$

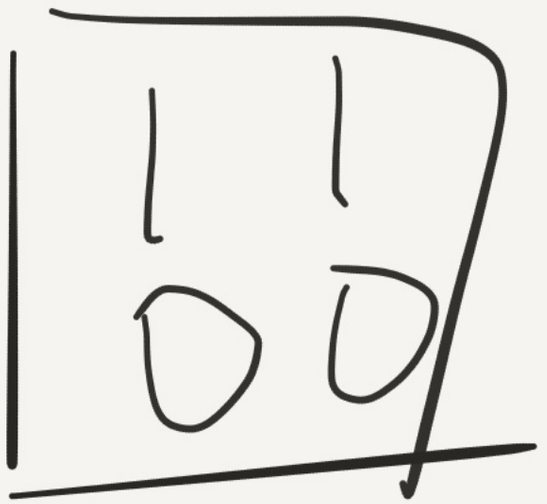
$$dp[i][j] = \sum_{k=0}^{j} f(k) \cdot dp[i-1][j-k]$$

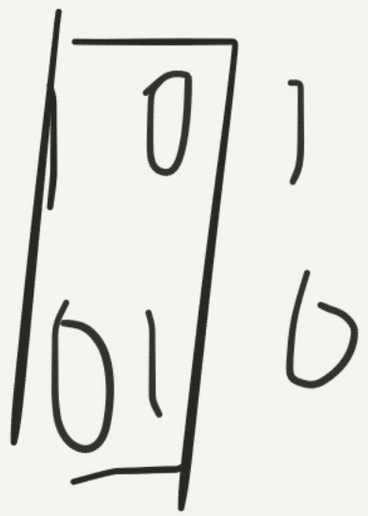
$$f(x) = ax^2 + bx + c$$

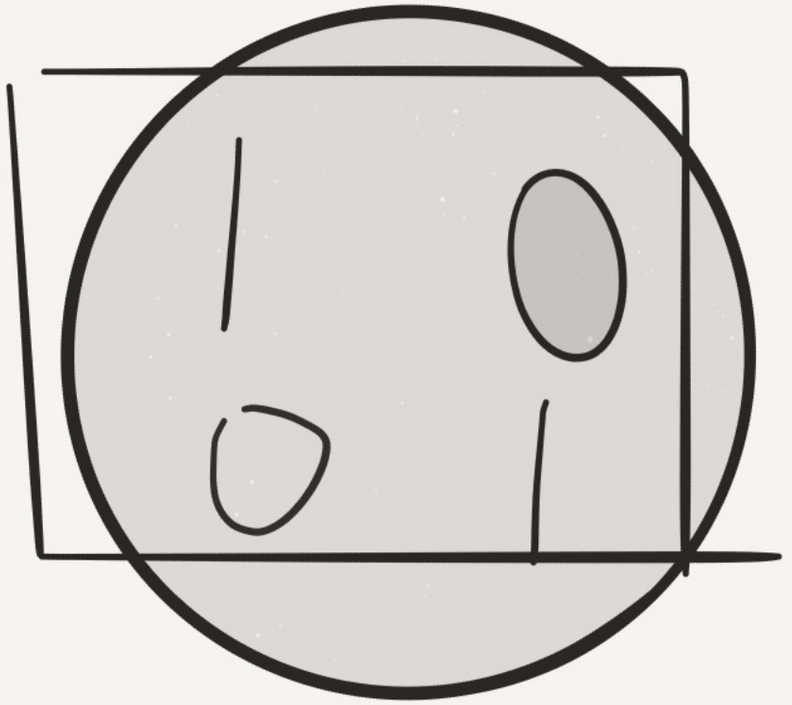
$$\binom{n+1}{3}$$

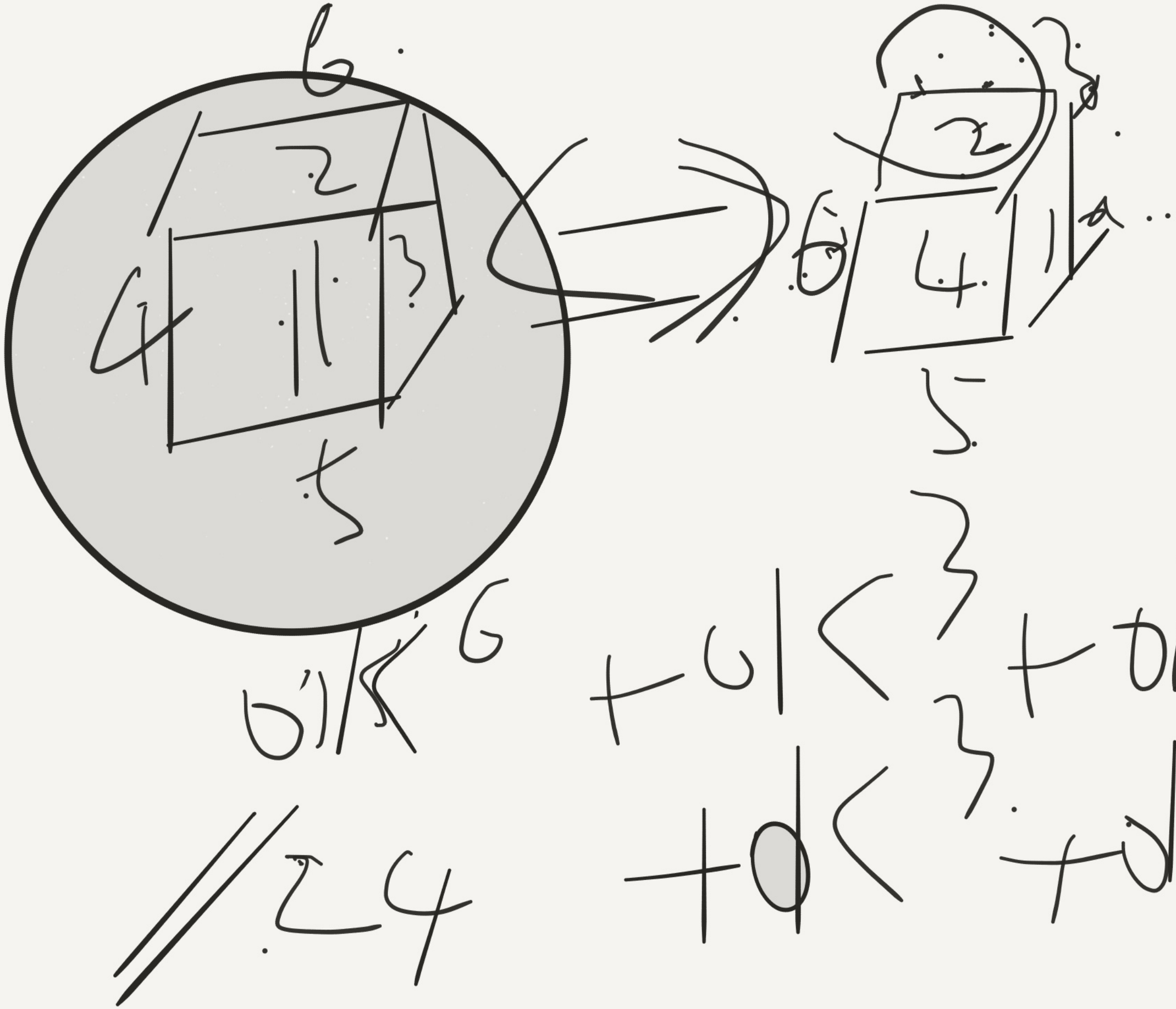
1 3 6 10 ...









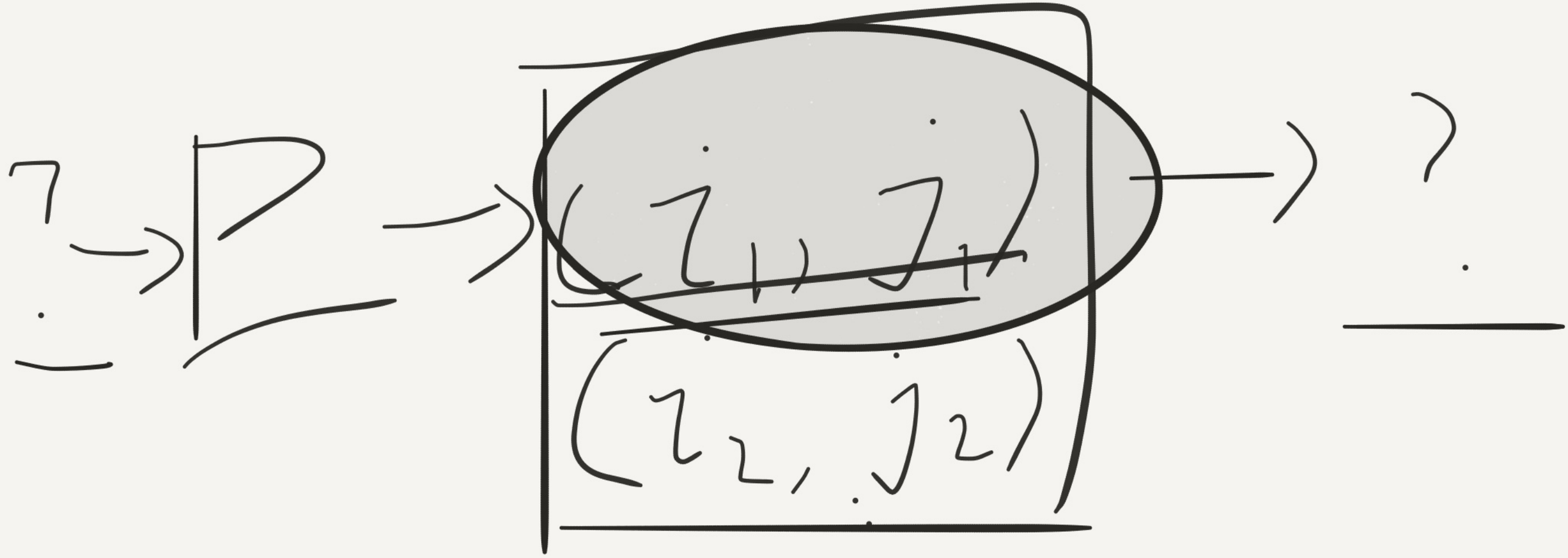


$$\frac{(i,j)}{i=0..n-1}$$

$$j=0--m-1$$

$$\frac{gcd(u,n)\sqrt{n}}{gcd(v,m)\sqrt{m}}$$

$$\frac{1}{n_{M(i,j)}} \sum_{(i,j)} S(i,j)$$



$(x_1 - x_1', y_1 - y_1')$

$(x_2 - x_1', y_2 - y_2')$

.

.

.

.

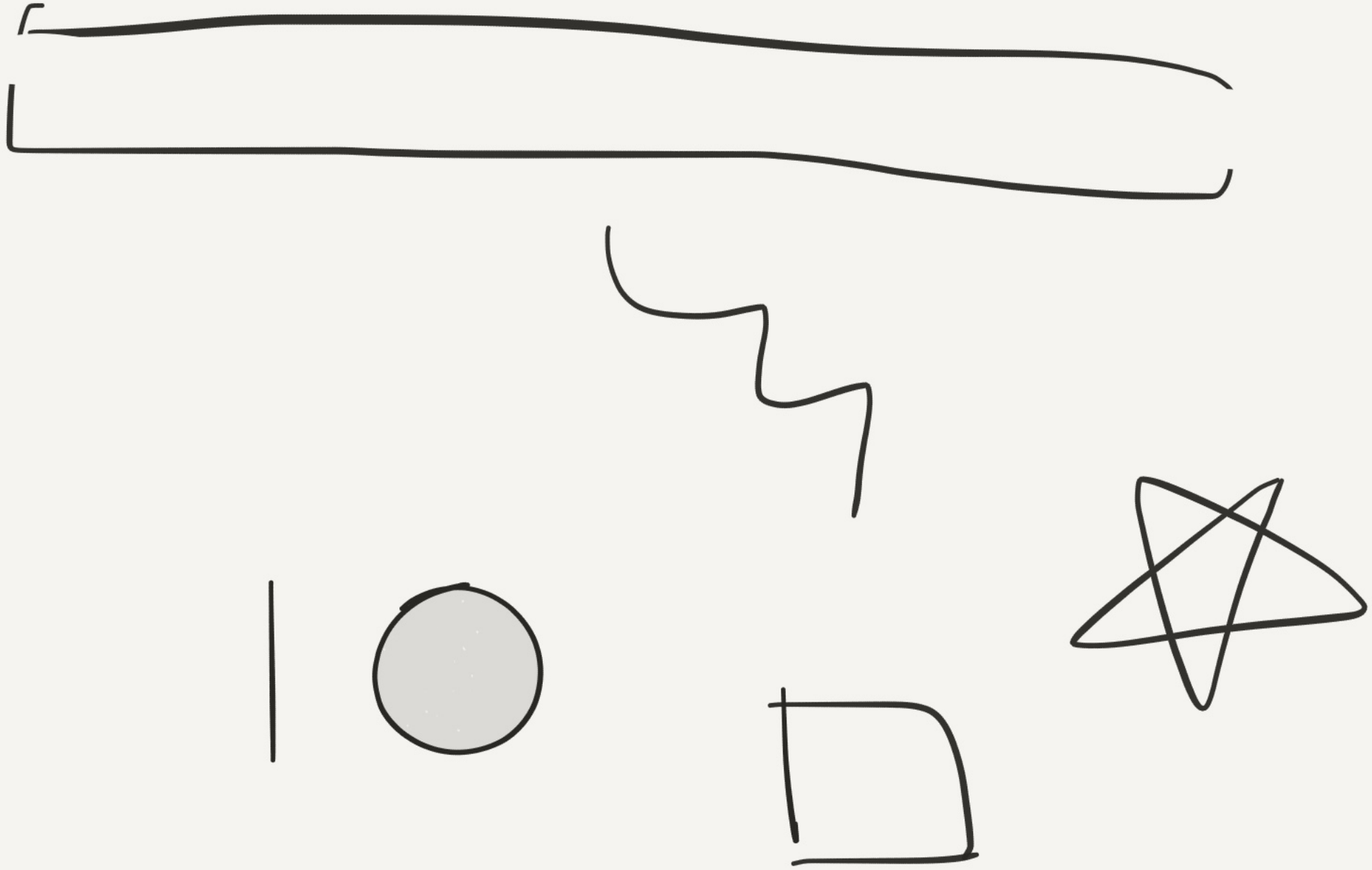
.

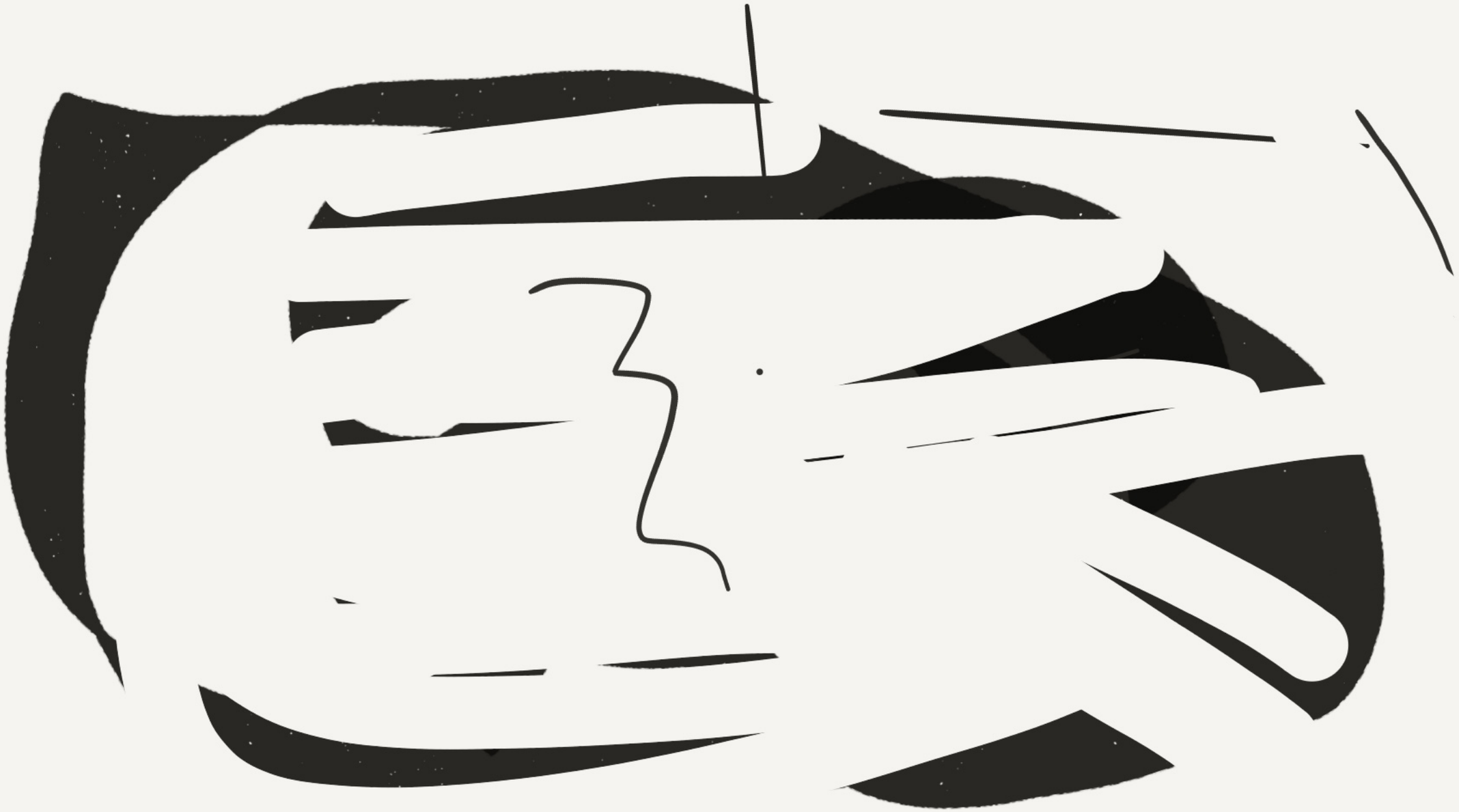
.

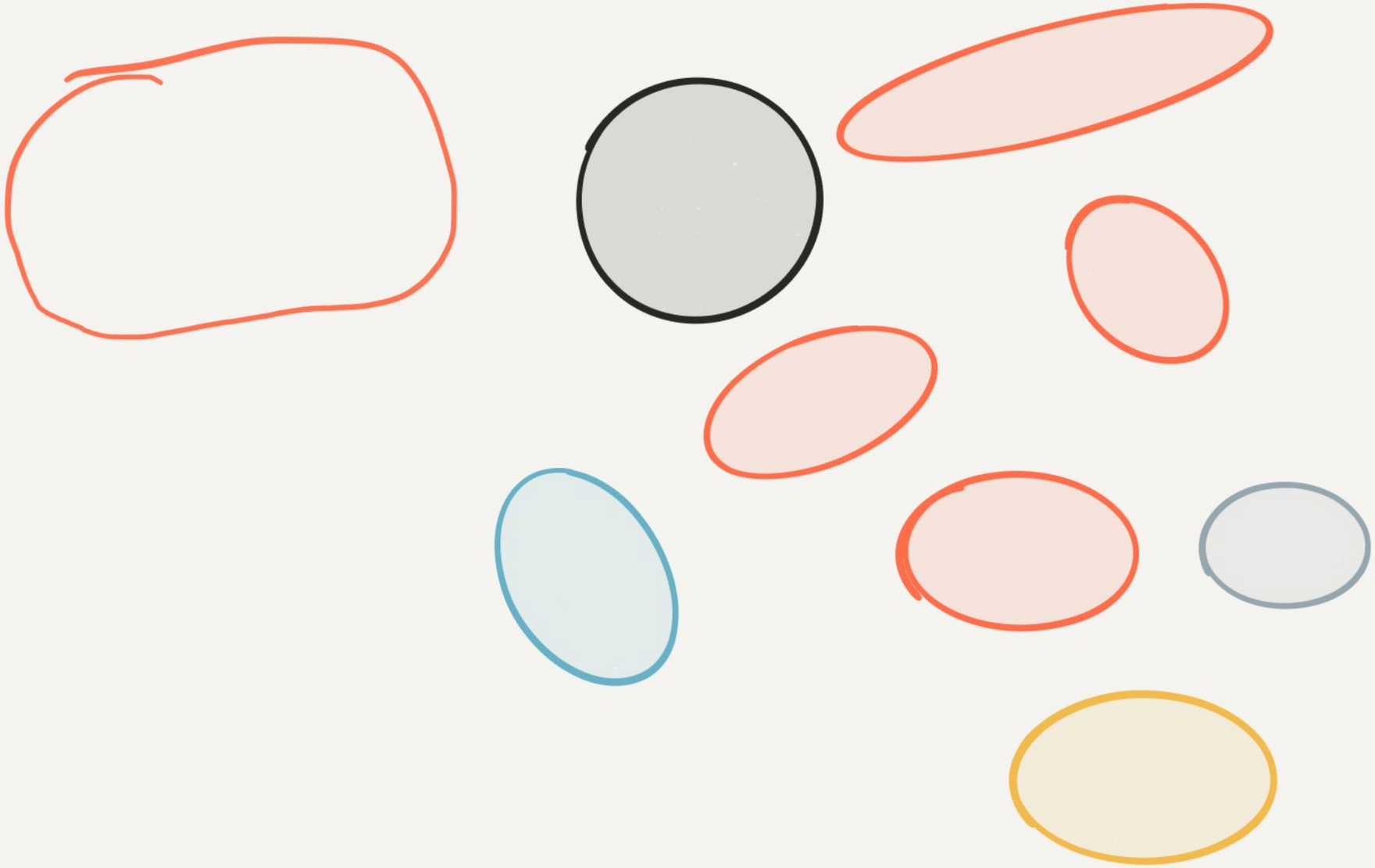
$(x_n - x_1', y_n - y_1')$

$$\text{Ans} = \frac{1}{nm} \sum_{(i,j)} \frac{g(i,j)}{\text{lcm}(\gcd(i,n), \gcd(j,m))}$$

$$\left(P^{\frac{L}{LM}} r(c) = c \right)^{\frac{hm}{LCM}}$$

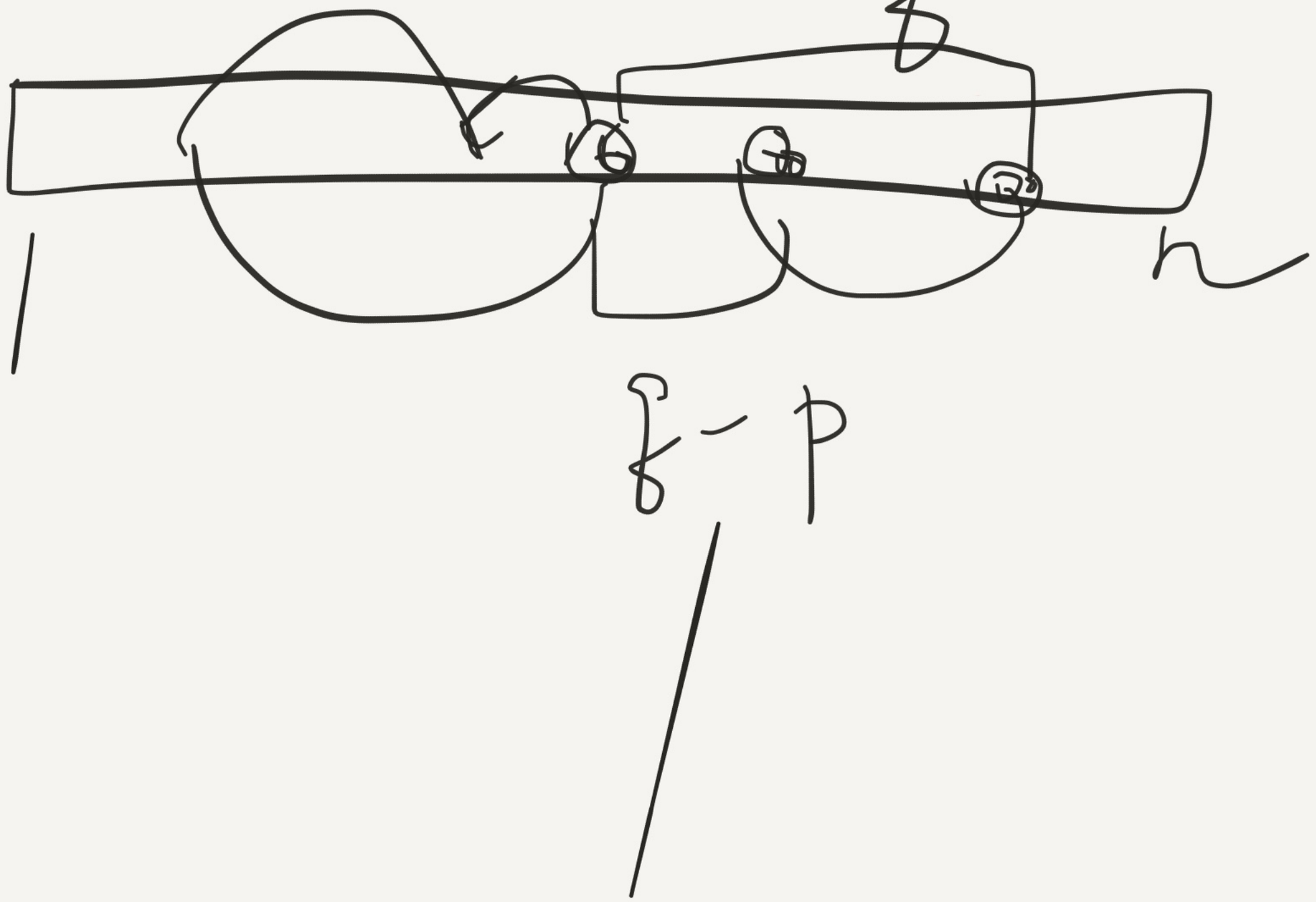


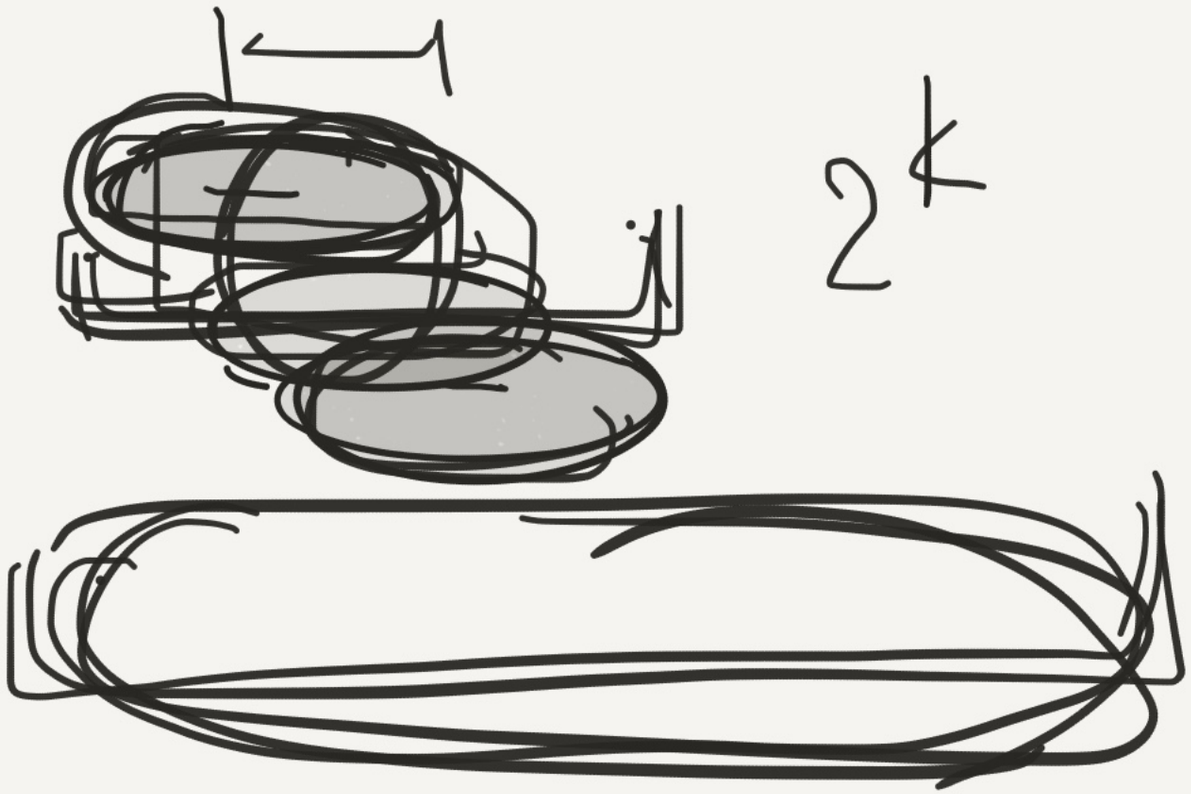




$p + f \leq \mu e$

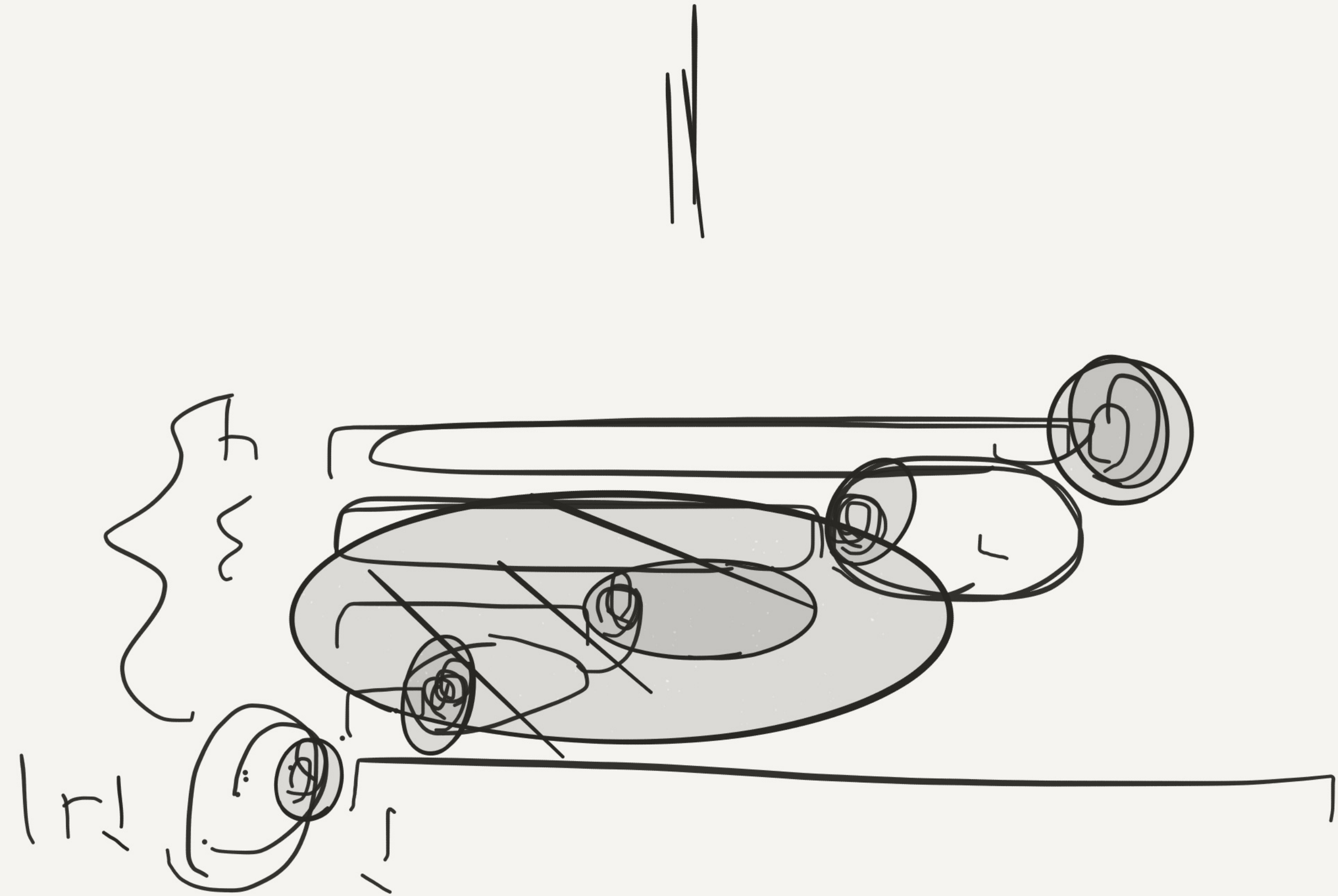
$f < \xi$

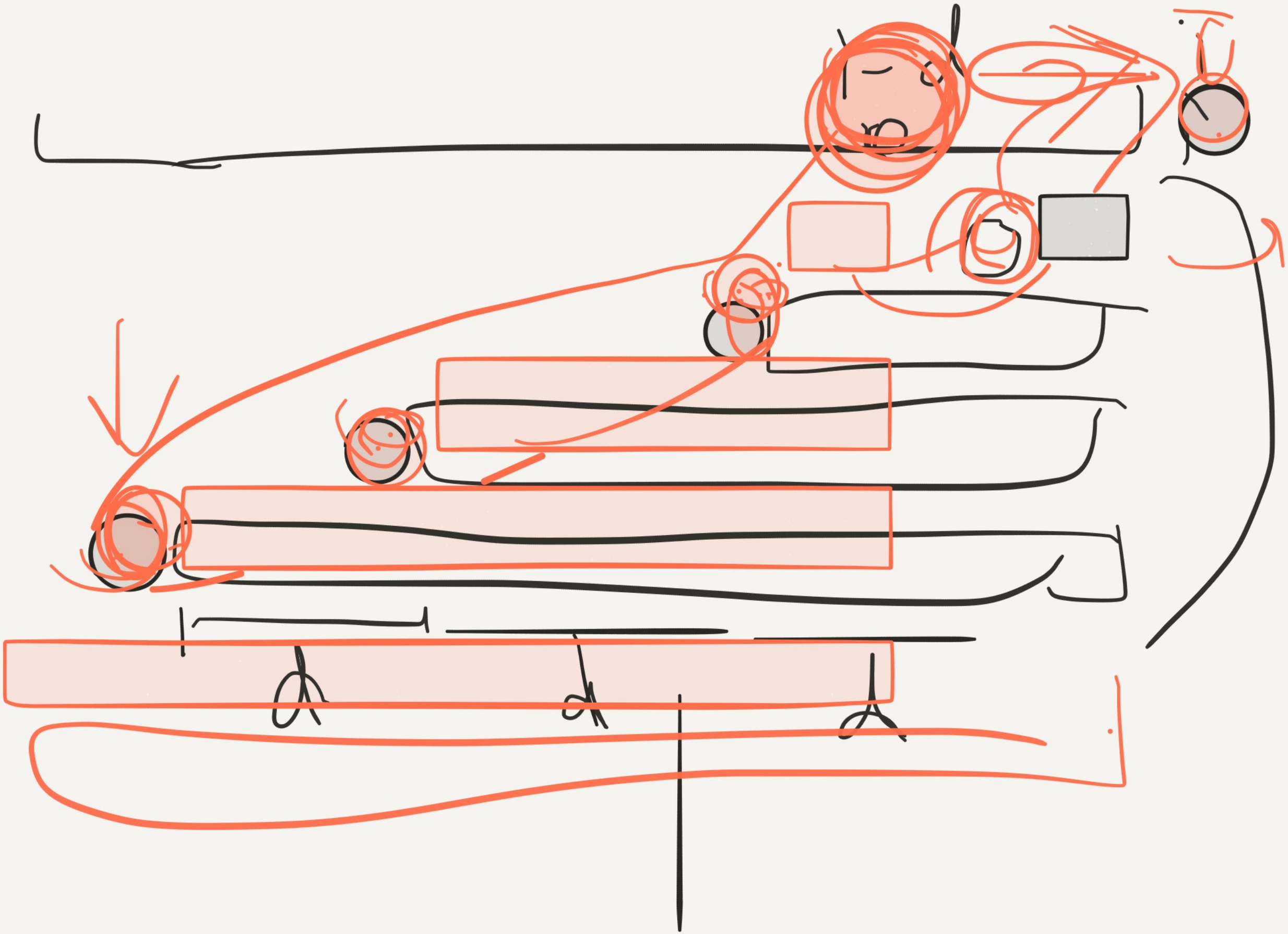




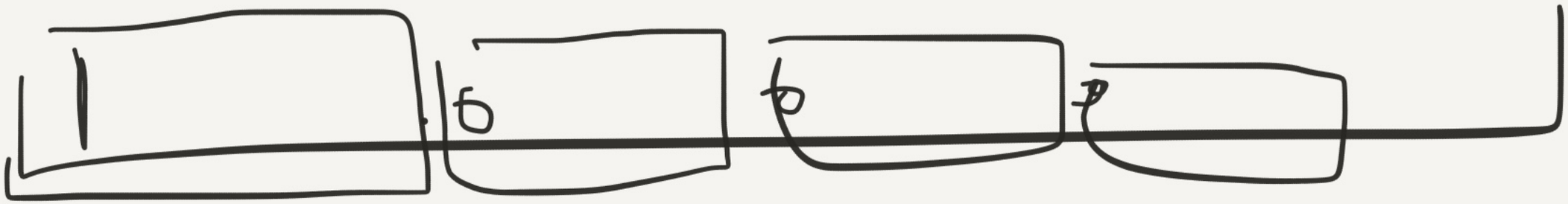
$O(1)$

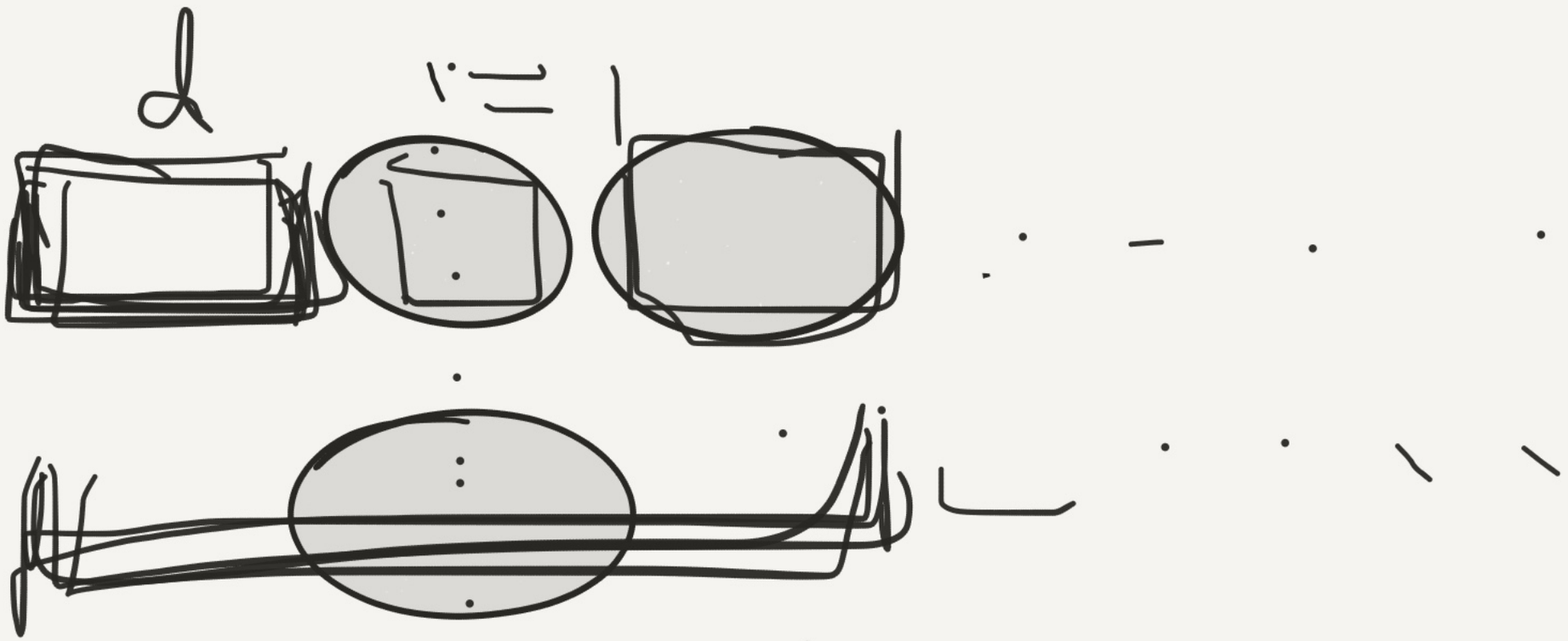
$\leq \quad O(1)$



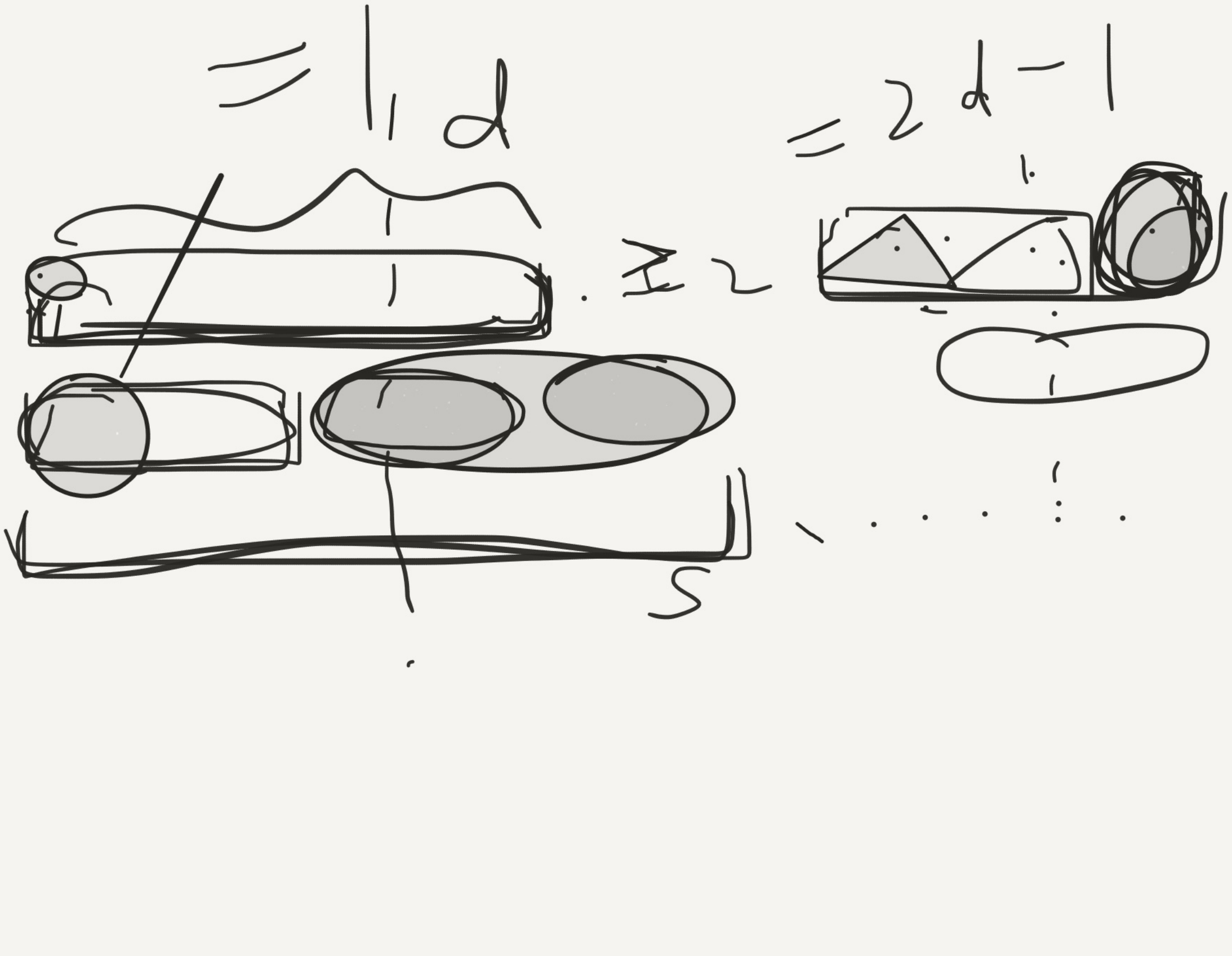


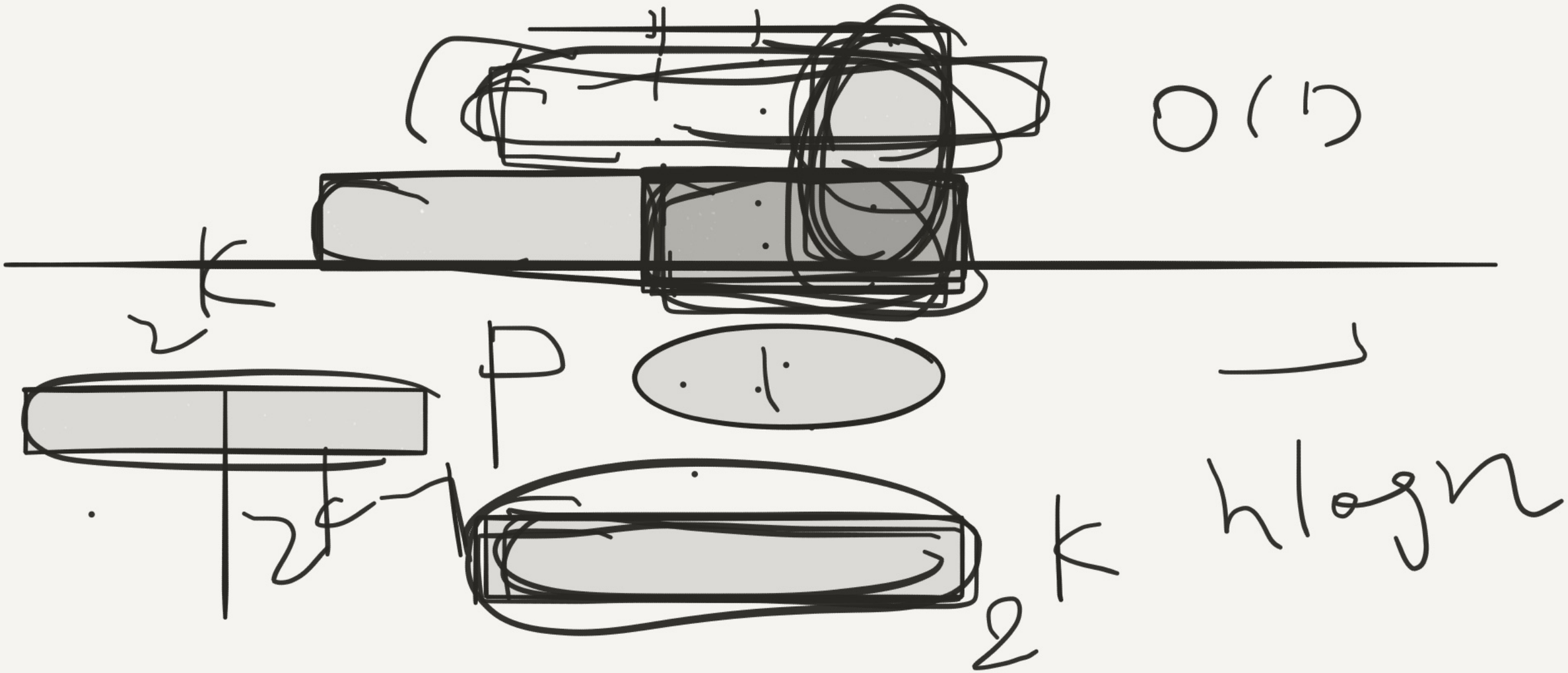
こと

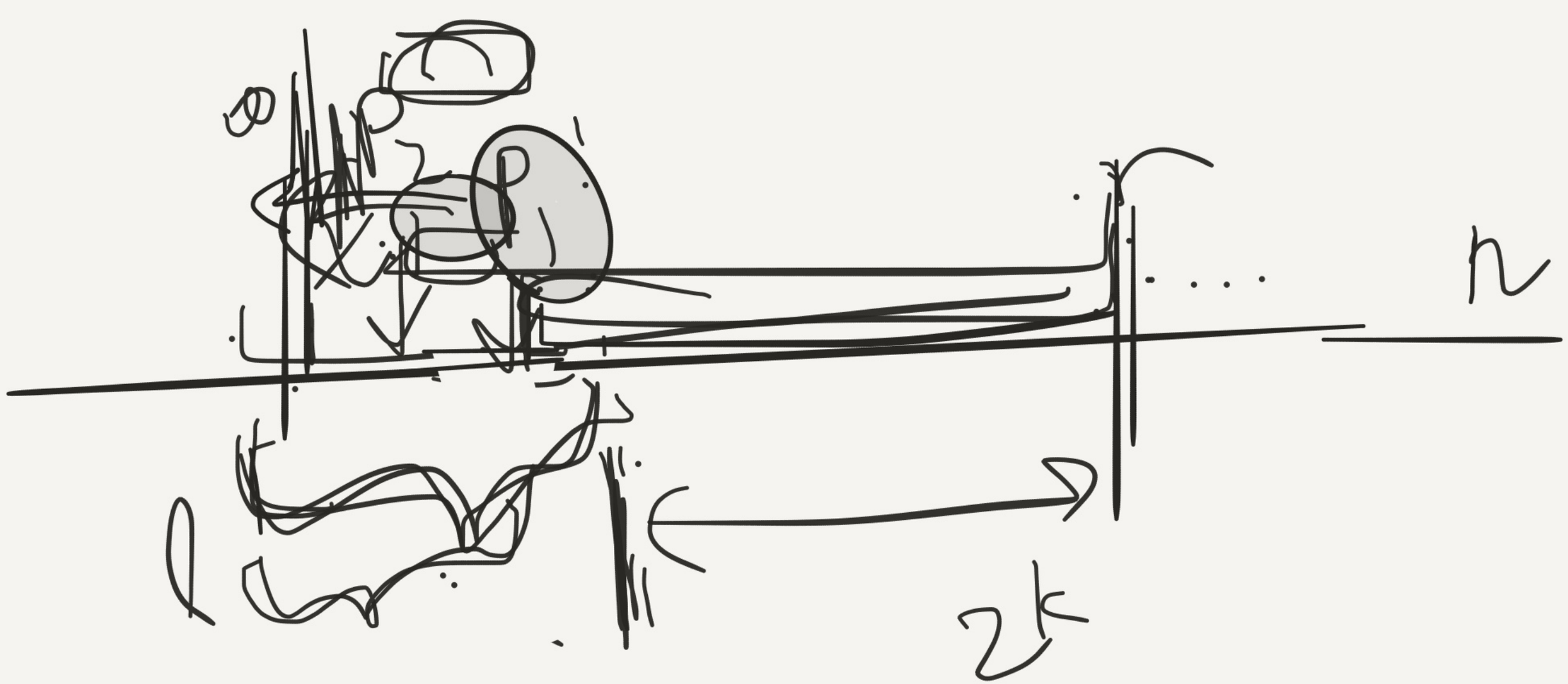




$= 2d+1$



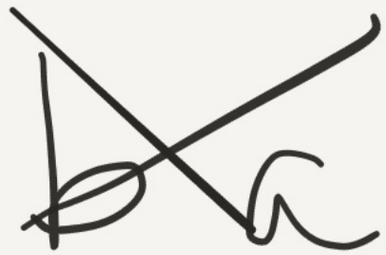


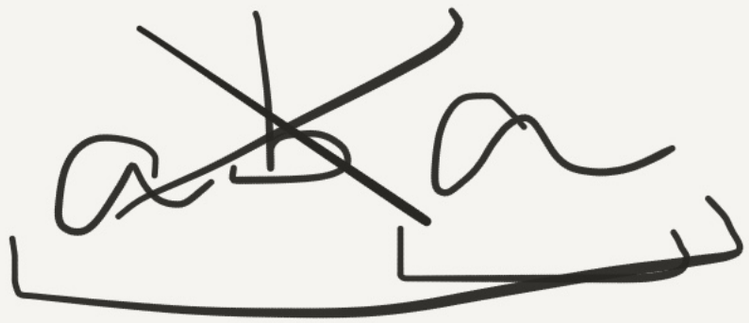

h
l
2k

a

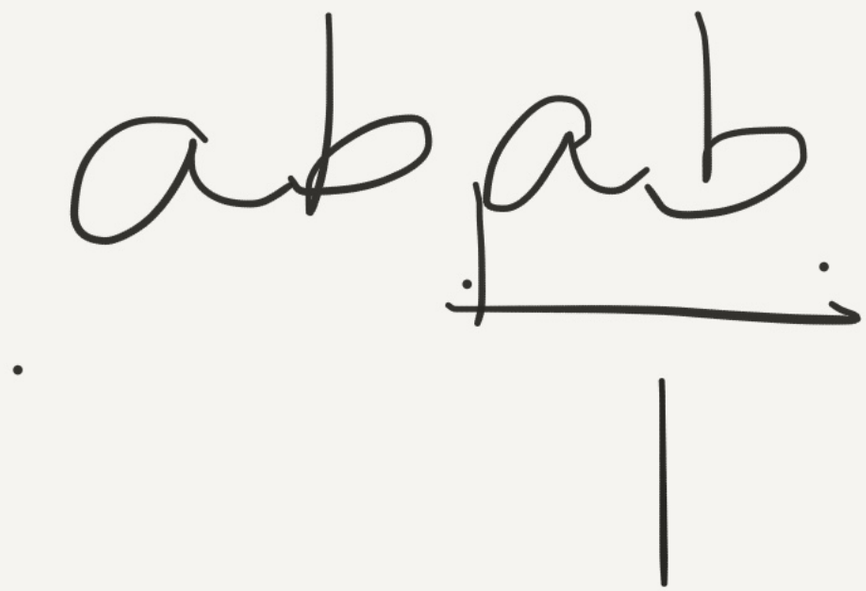
a b

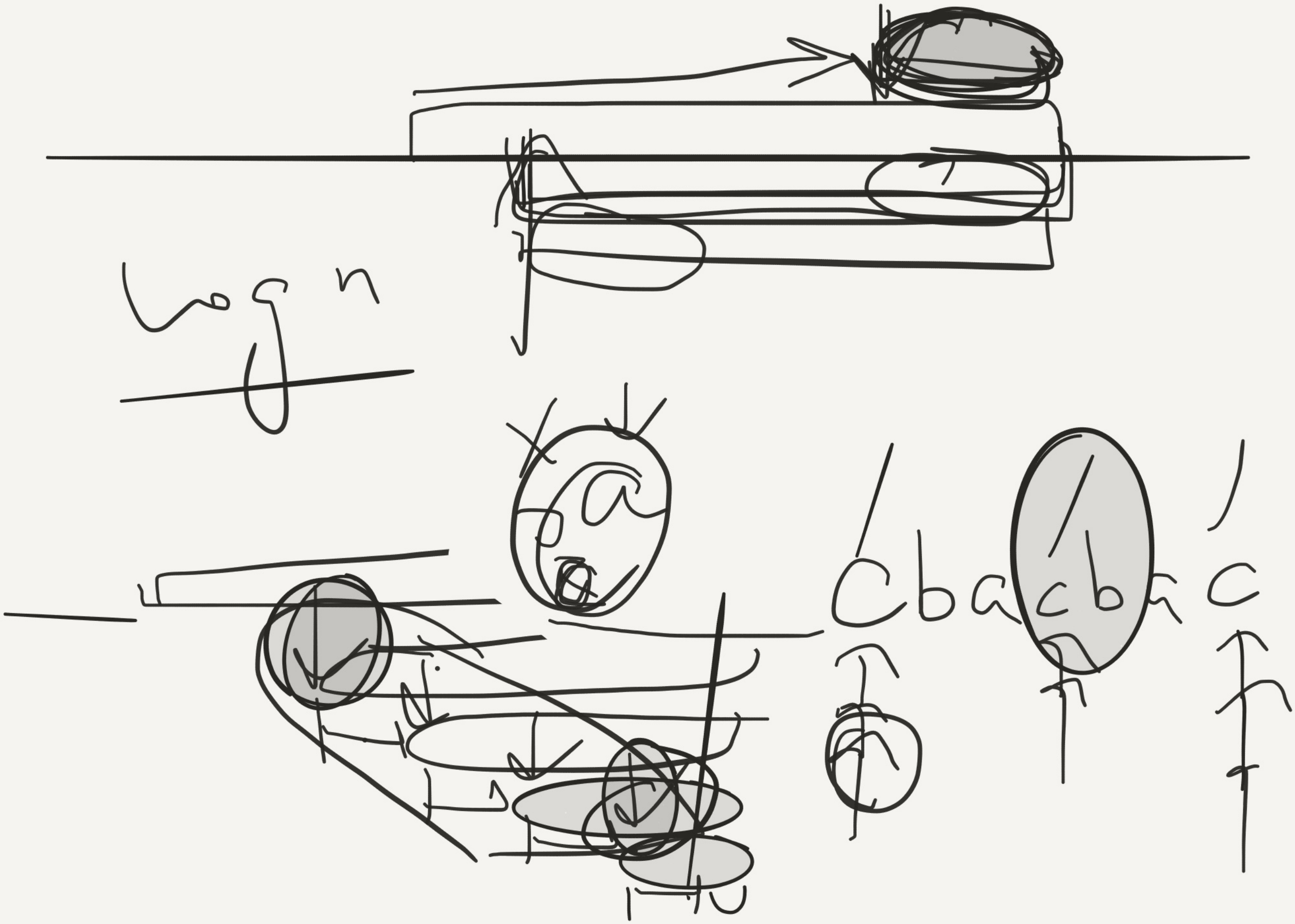
a a b

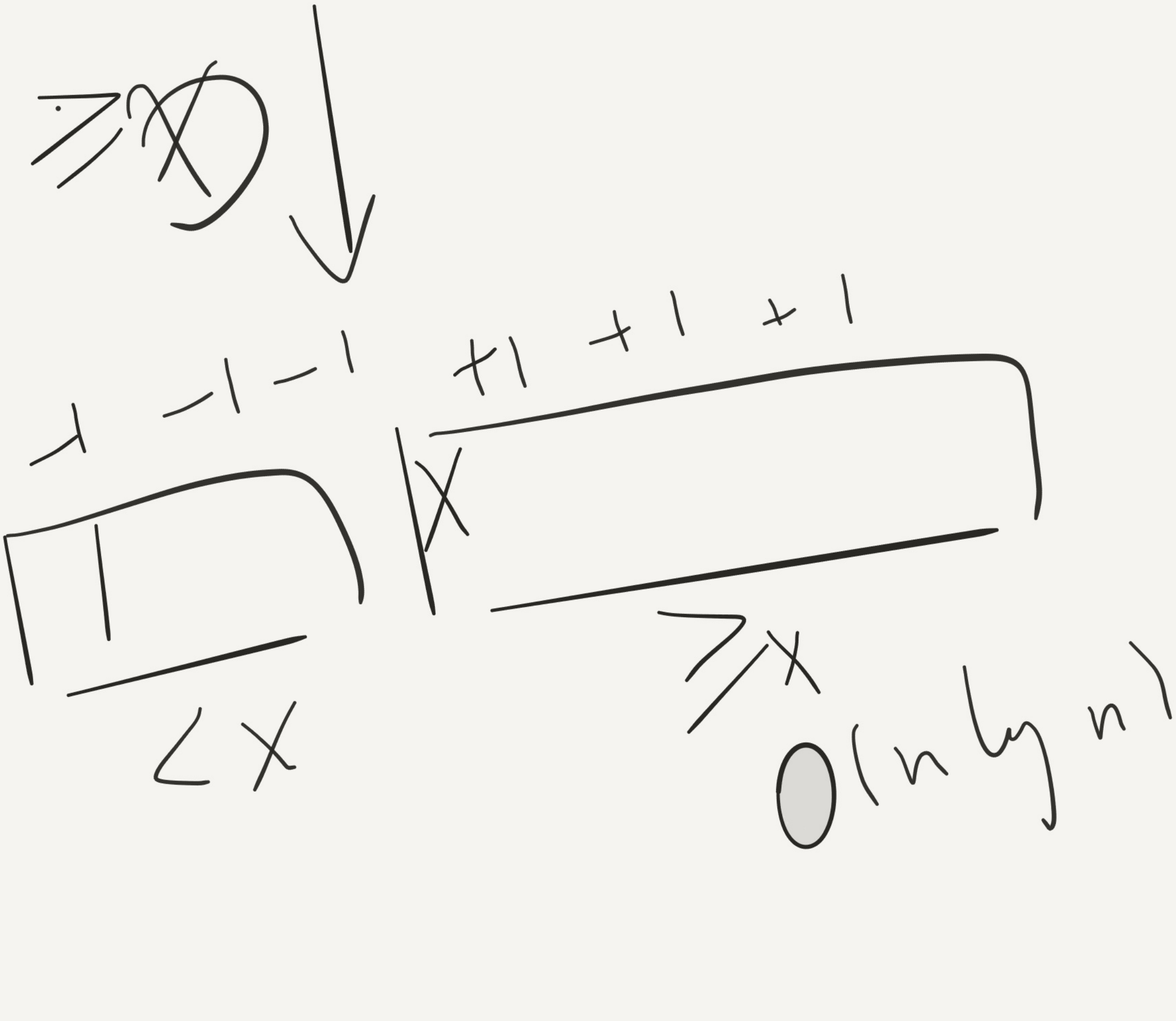




a b a b

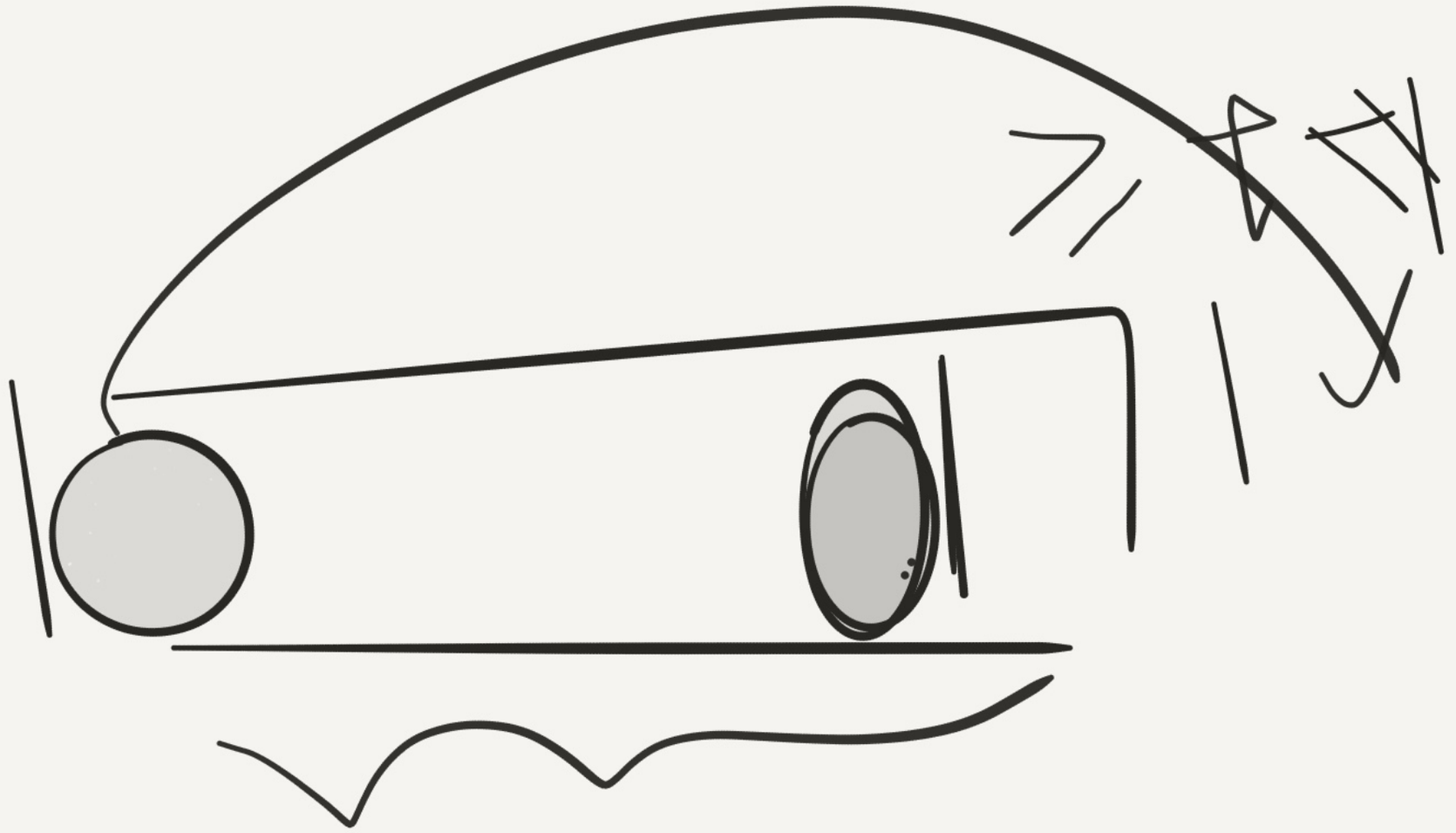



Login
Cba
cba
c

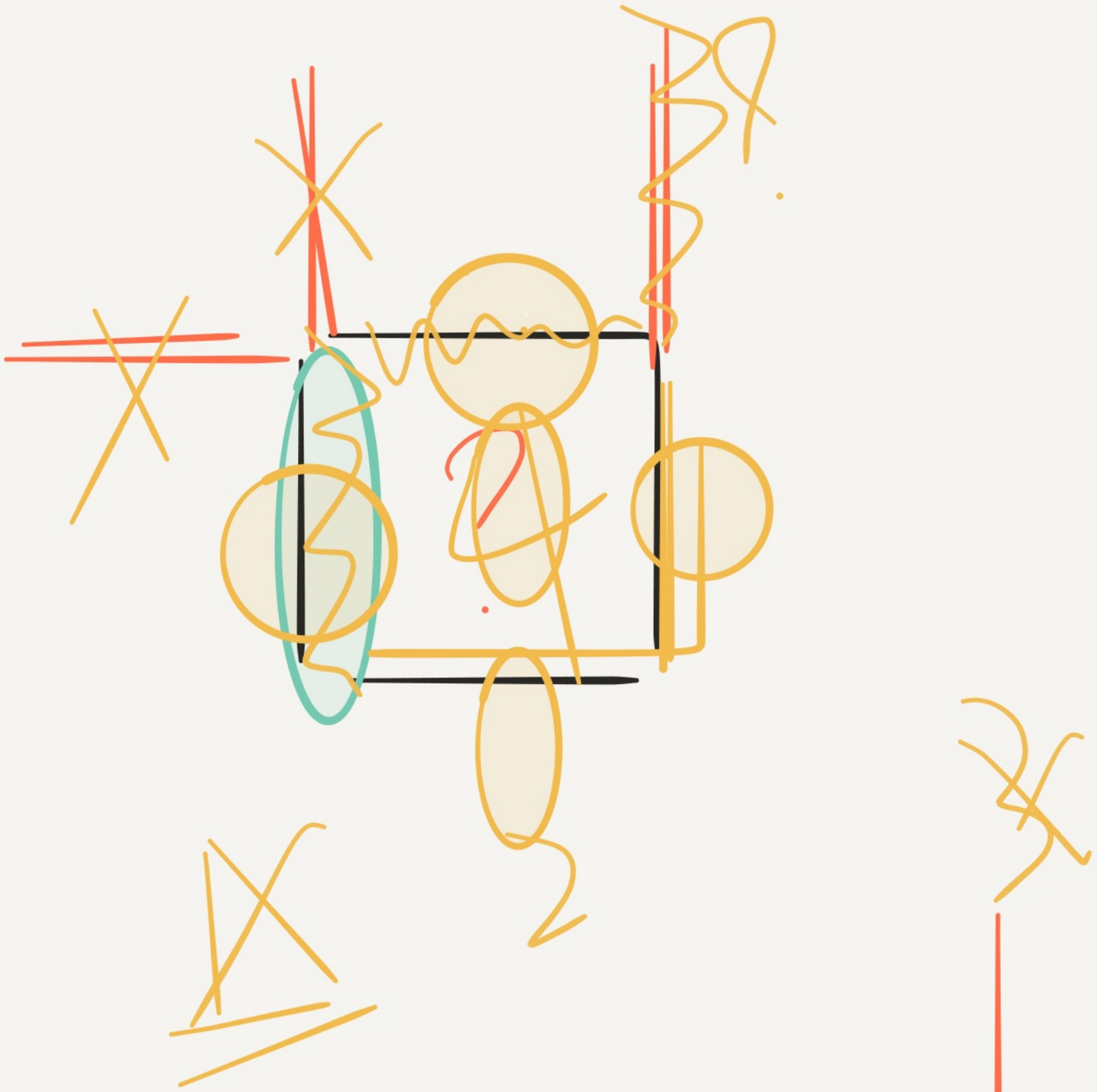

-1 -1 -1 +1 +1 +1
O(n log n)

1 2 3 . . . (n-1)

$2^n - 1$



$$f(e) \leq f(t-1) + f(t-2)$$

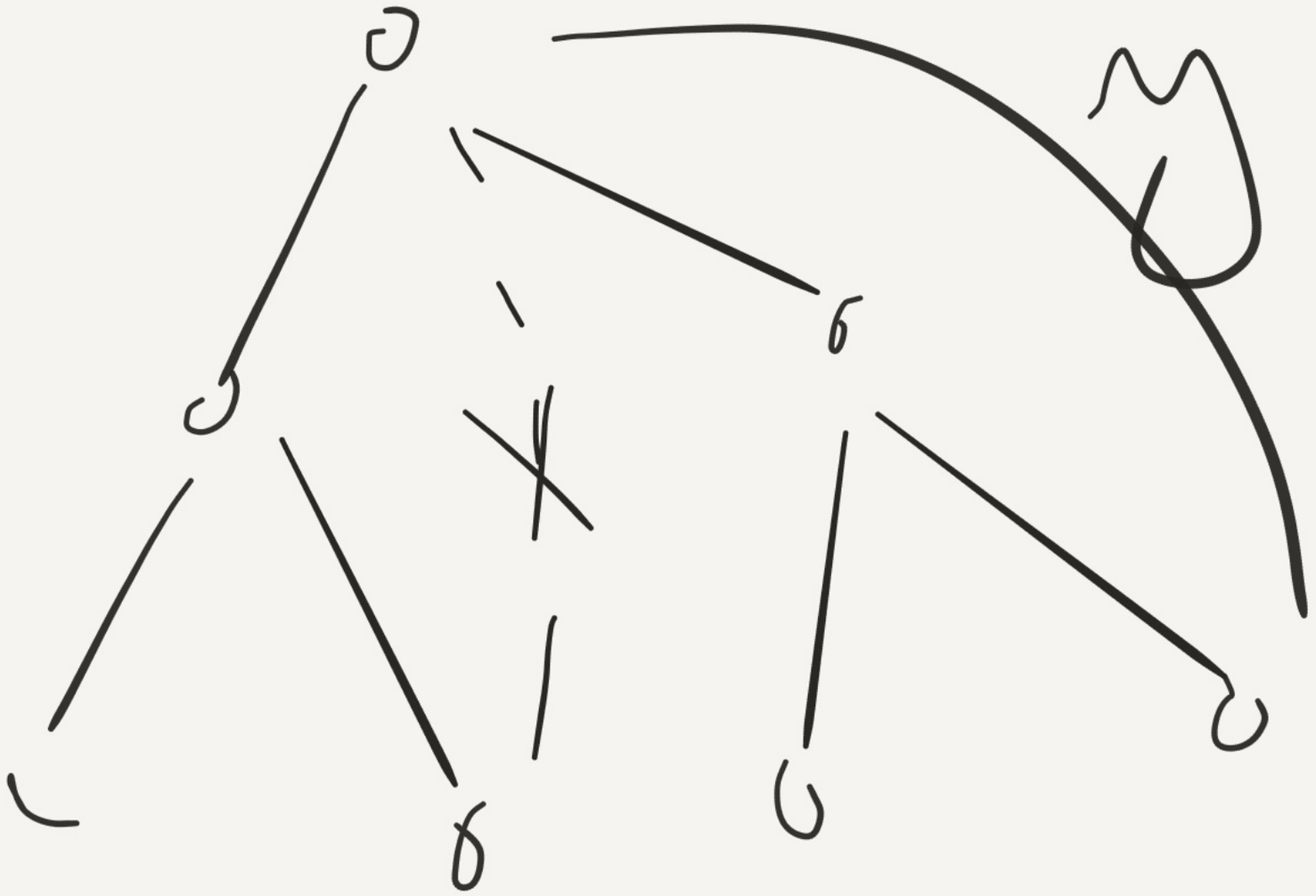


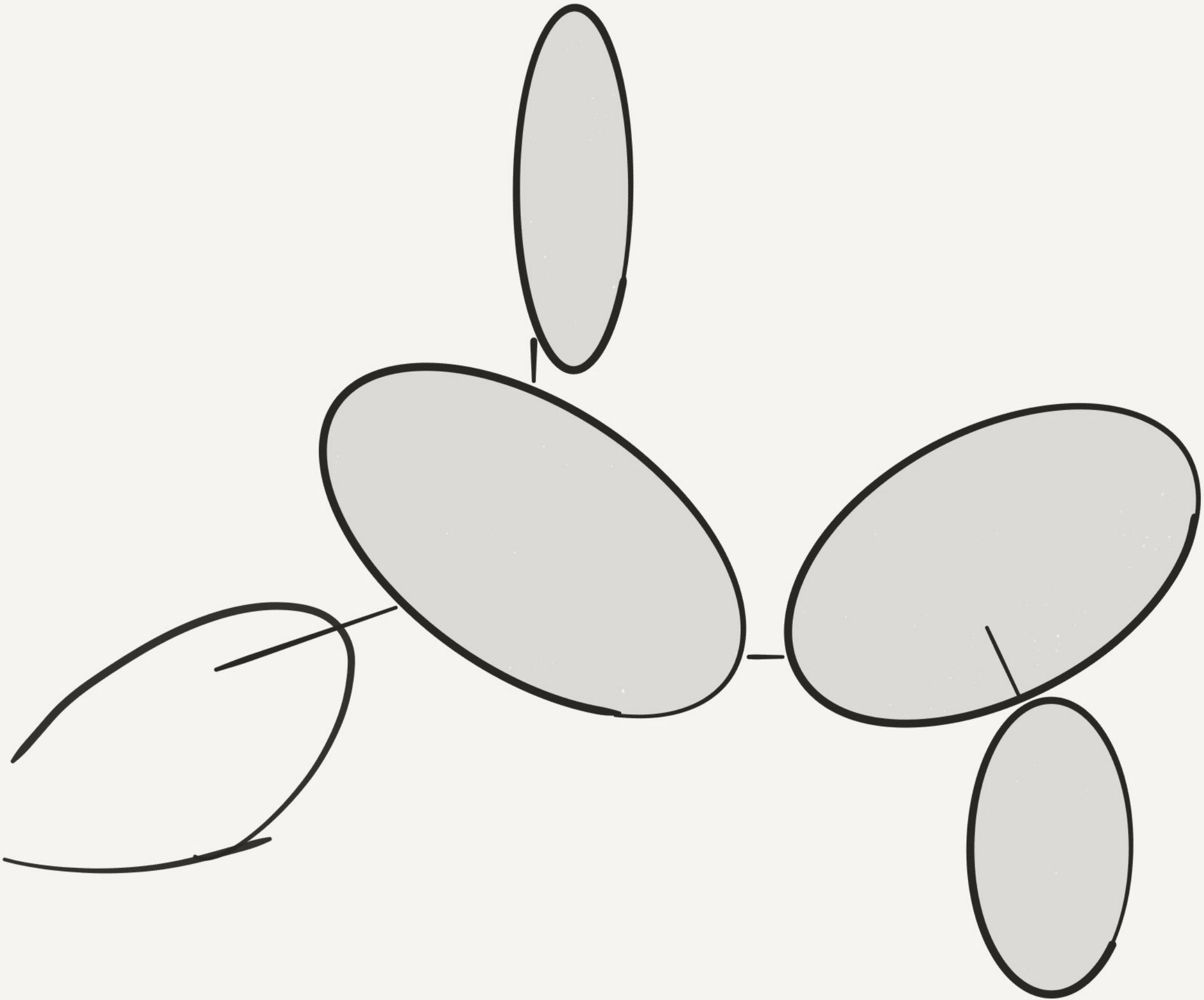
$$E[x^2]$$

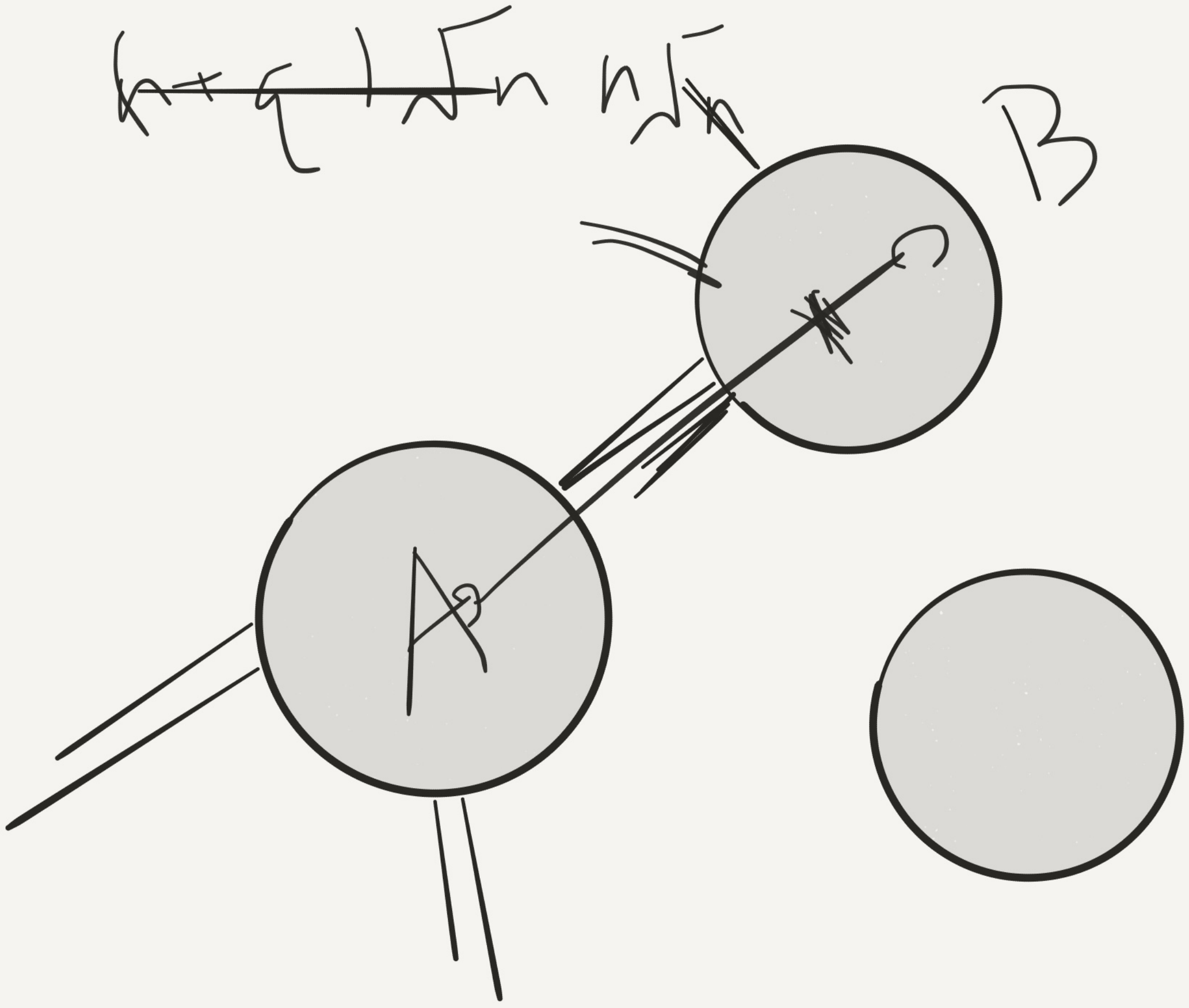
$$e \cdot t$$

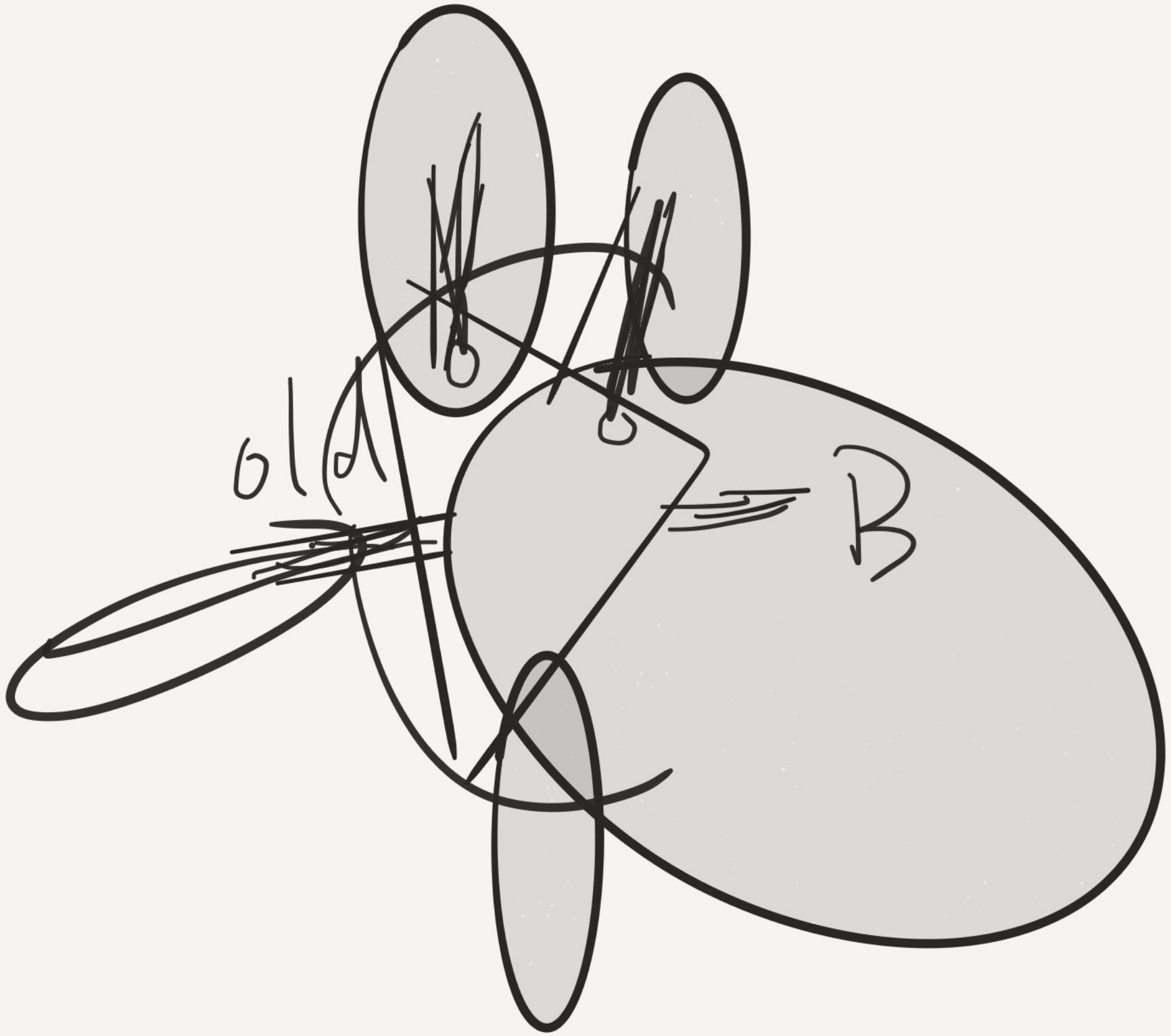
$$\Rightarrow E - V + c$$

$$2 \quad =$$








B

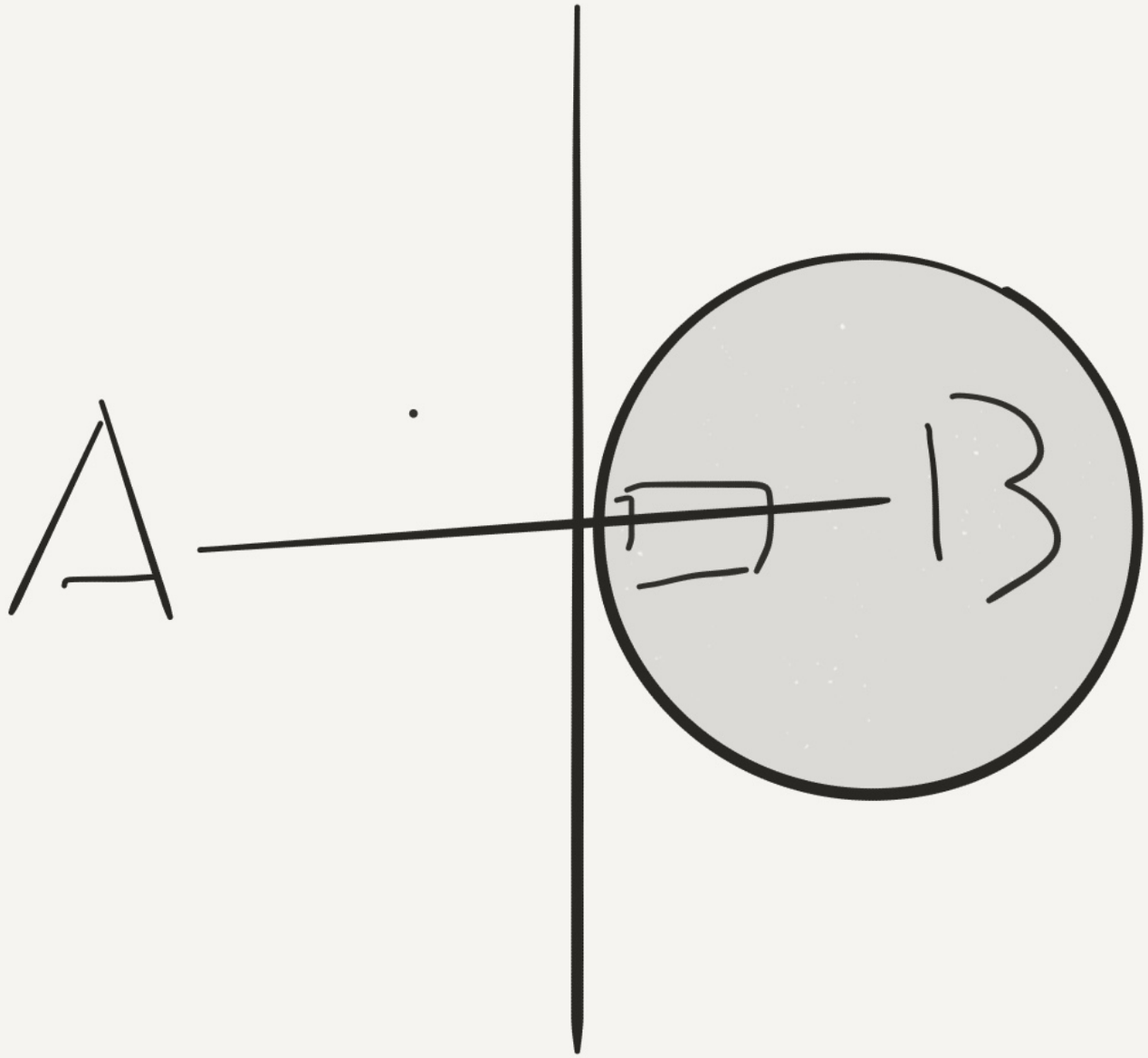
$$\sum \ln(1-x_i)$$

$$\ln(1-x) = -\sum \frac{x^i}{i}$$

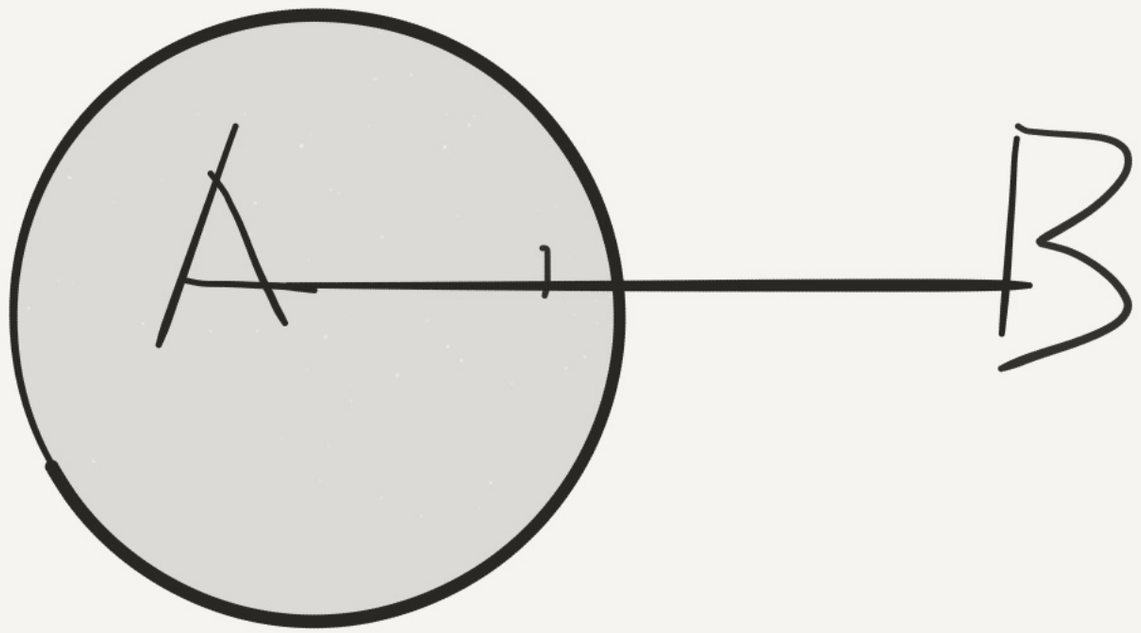
$$- \sum_{d=1}^{2^{\nu}} \sum_{i=1}^{r} \frac{\chi_{\eta}^{\alpha}}{A}$$

1. $k < d$

$k = 2t$



$k = 2t + 1$



$O(\frac{m}{n})$ $\sum a_i + k$

$m - b_0 + b_{n-1}$ $\equiv \sum b$ $m \cdot d$ w

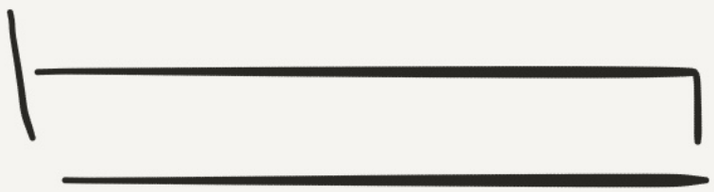
$$\sum_{i=1}^{n} \sum_{j=1}^{i-1} |a_i - a_j|^2$$

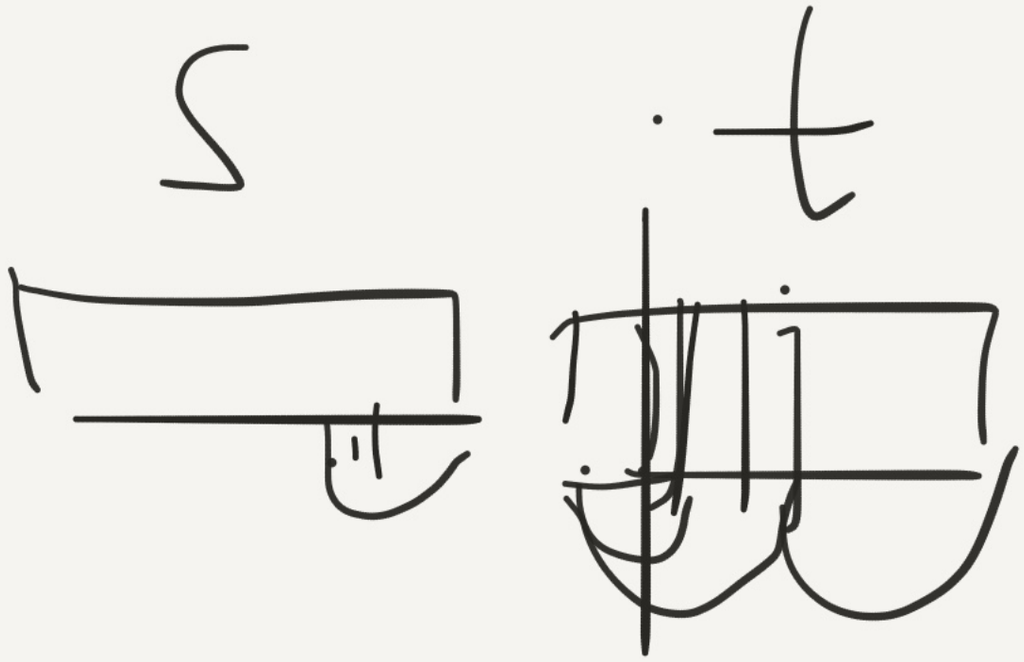
a. mdm

b

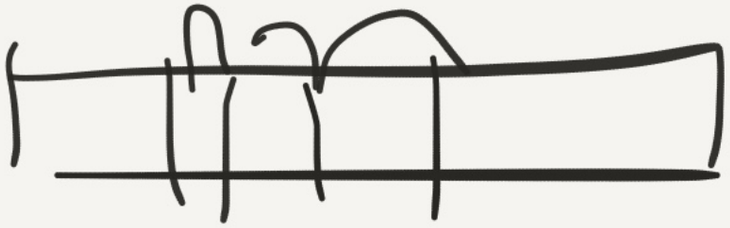
a

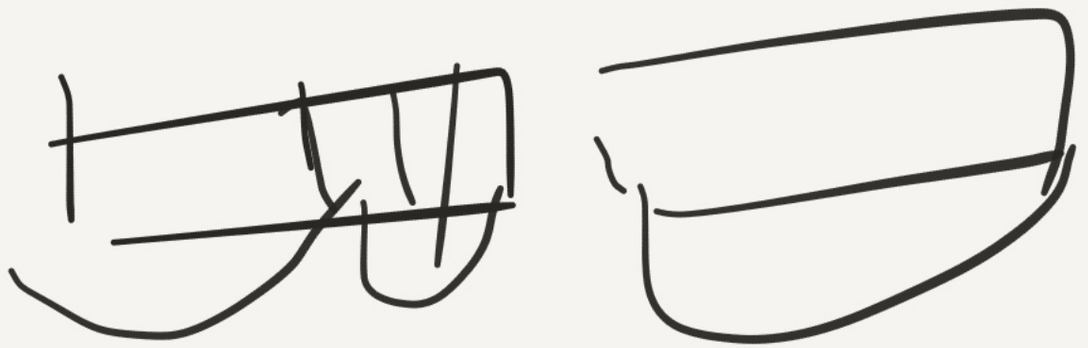
b

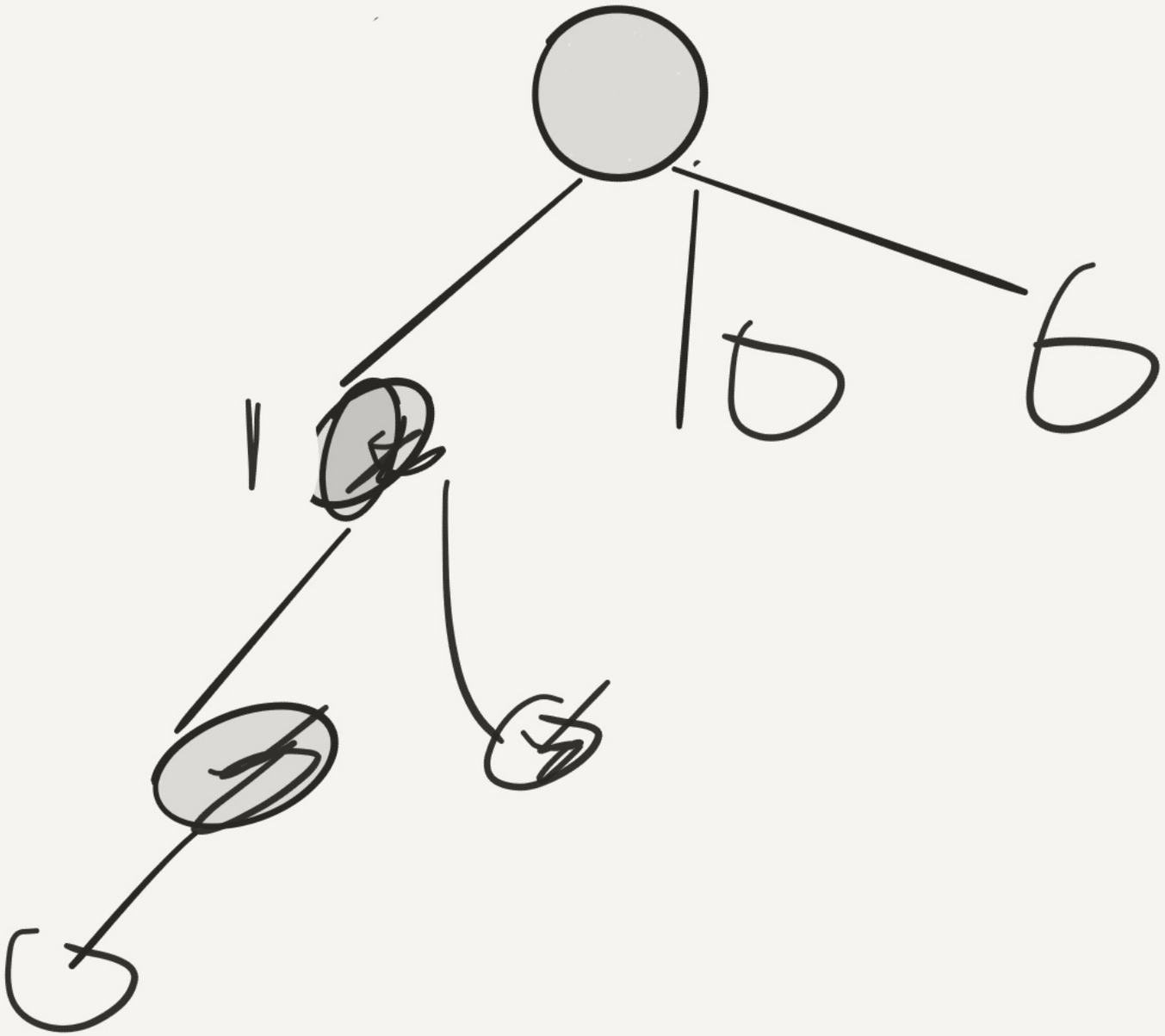


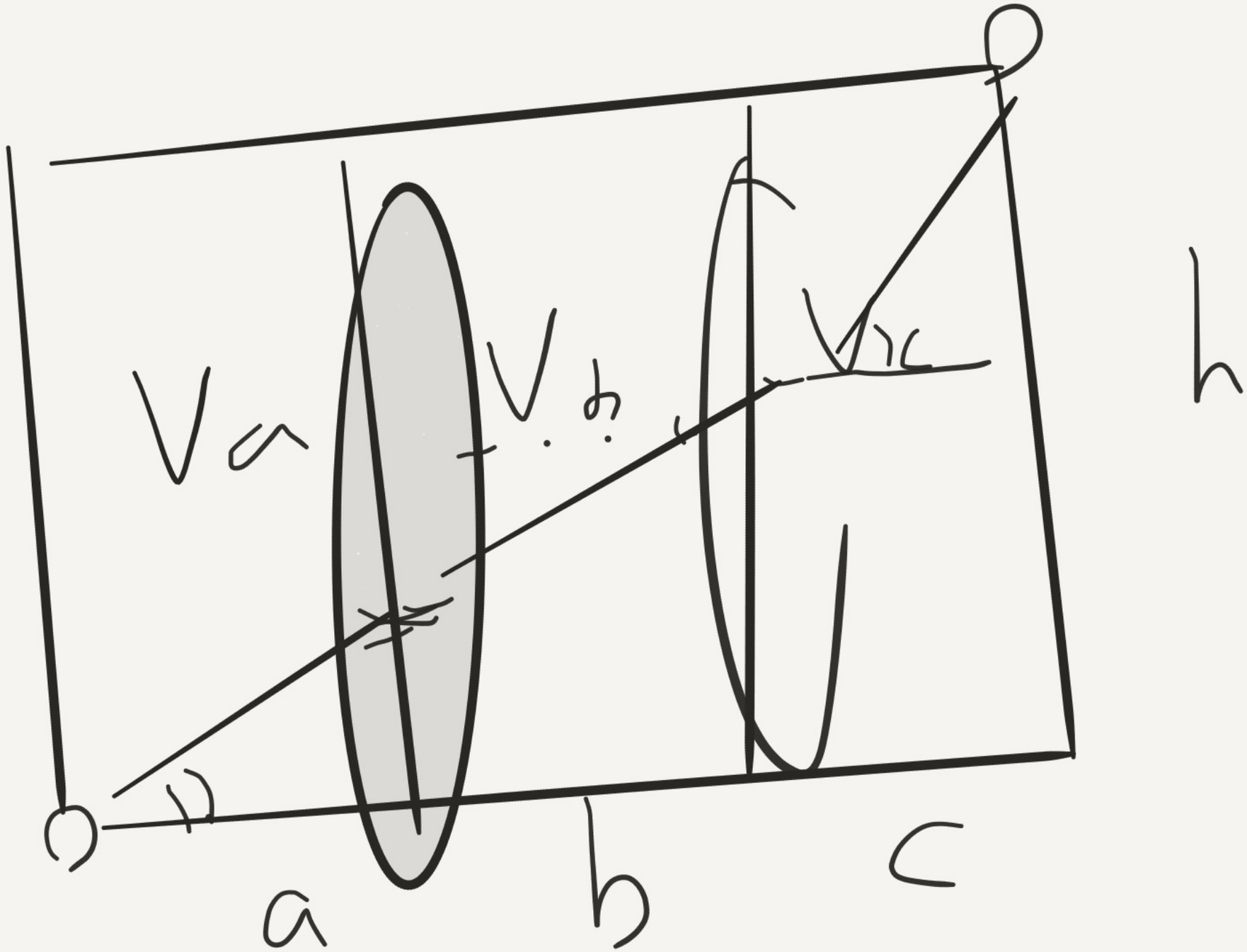


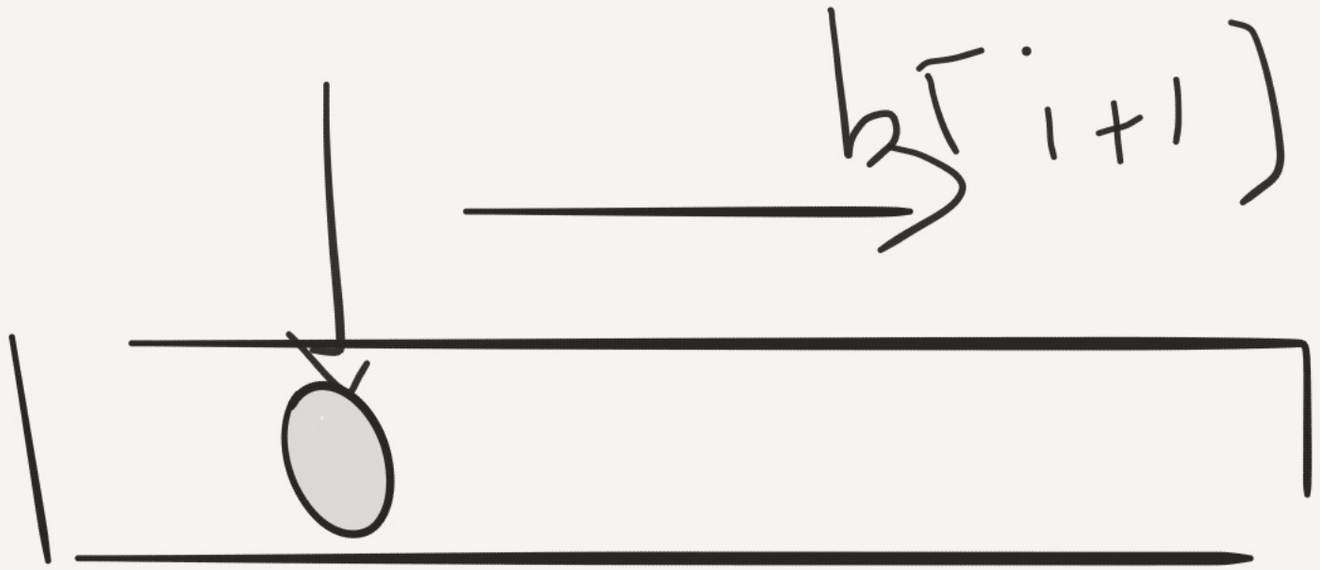
suff $\forall x_2$.

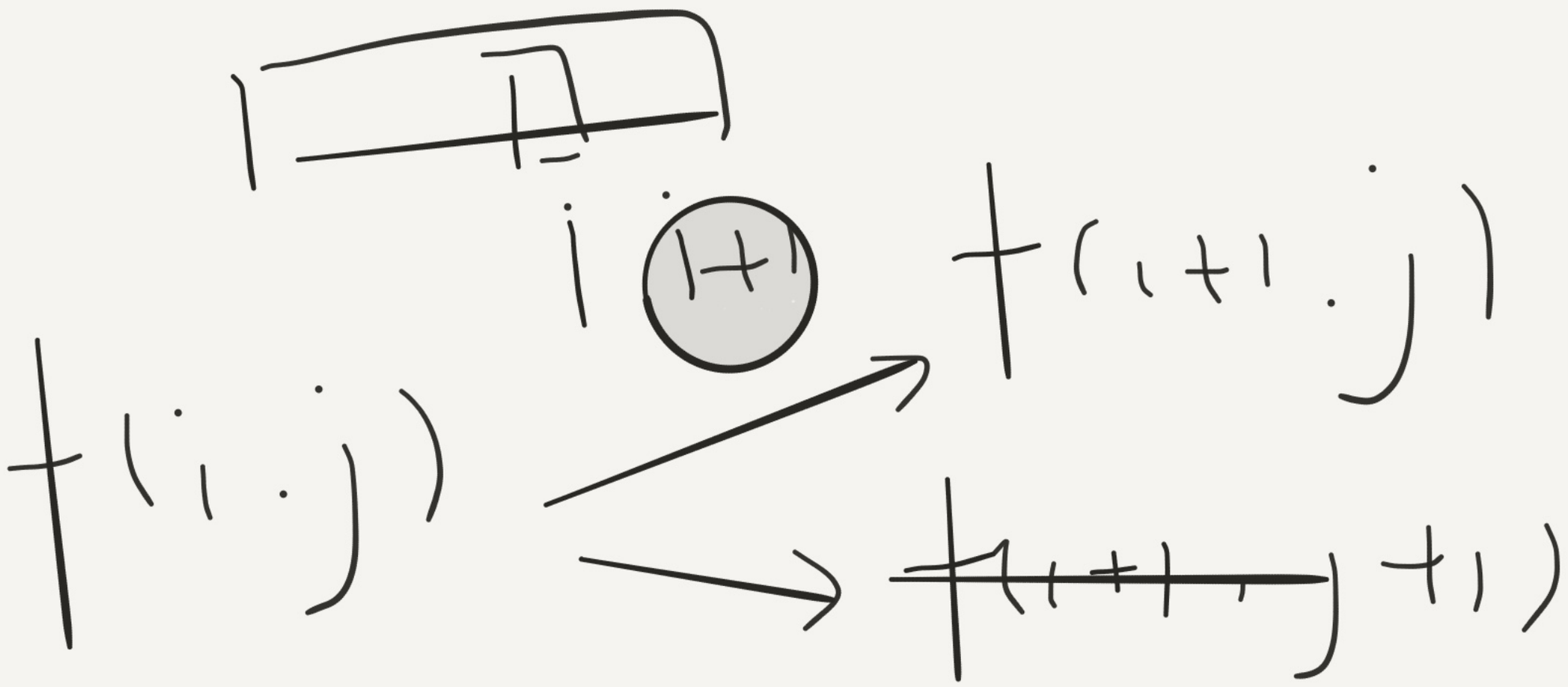


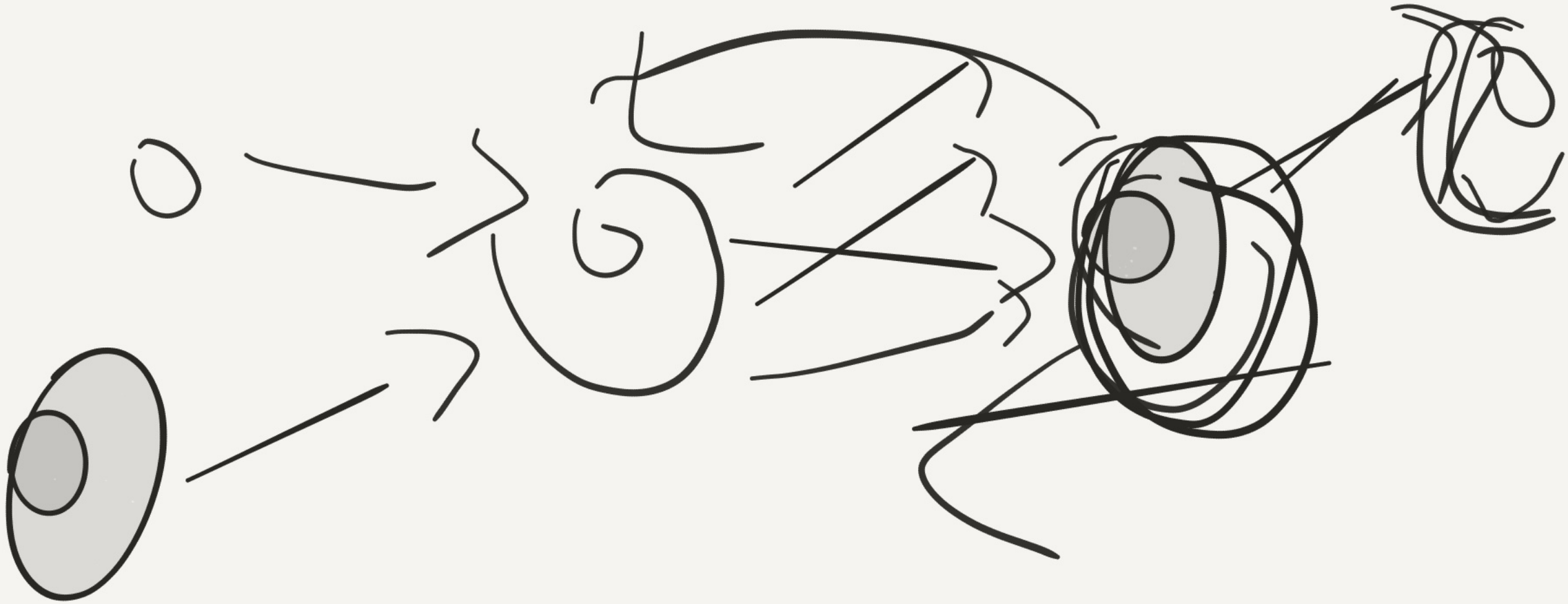


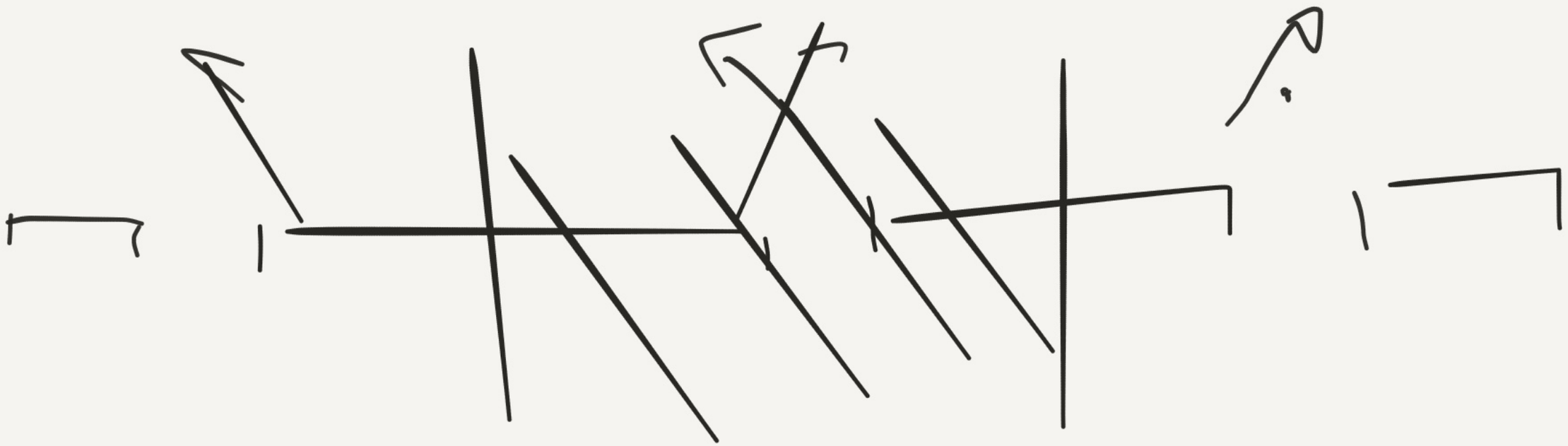


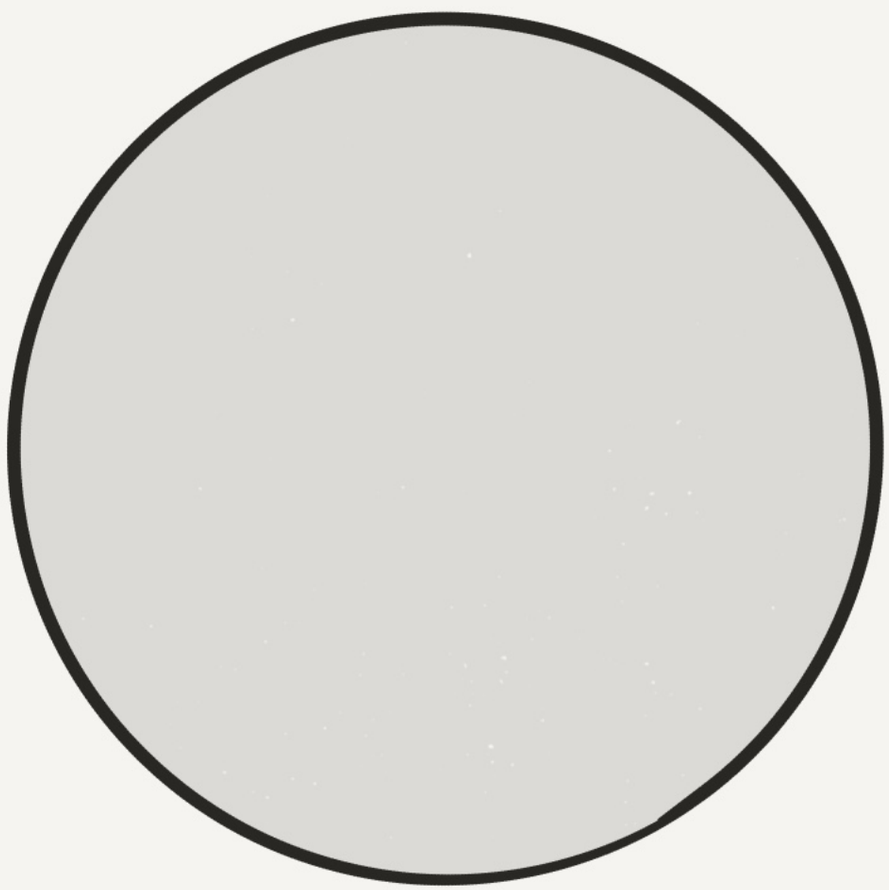

h
a
b
c

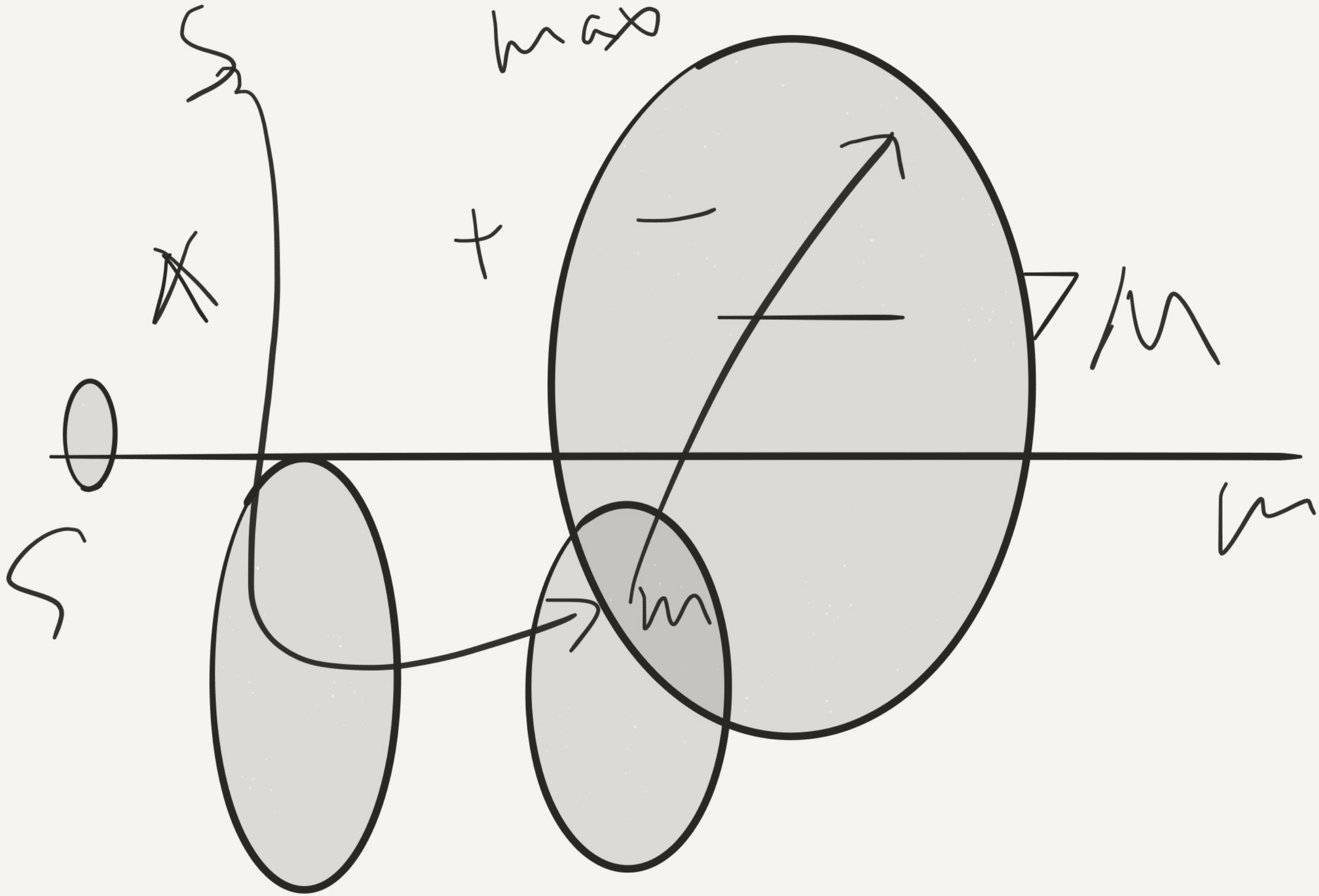

b[i+1]

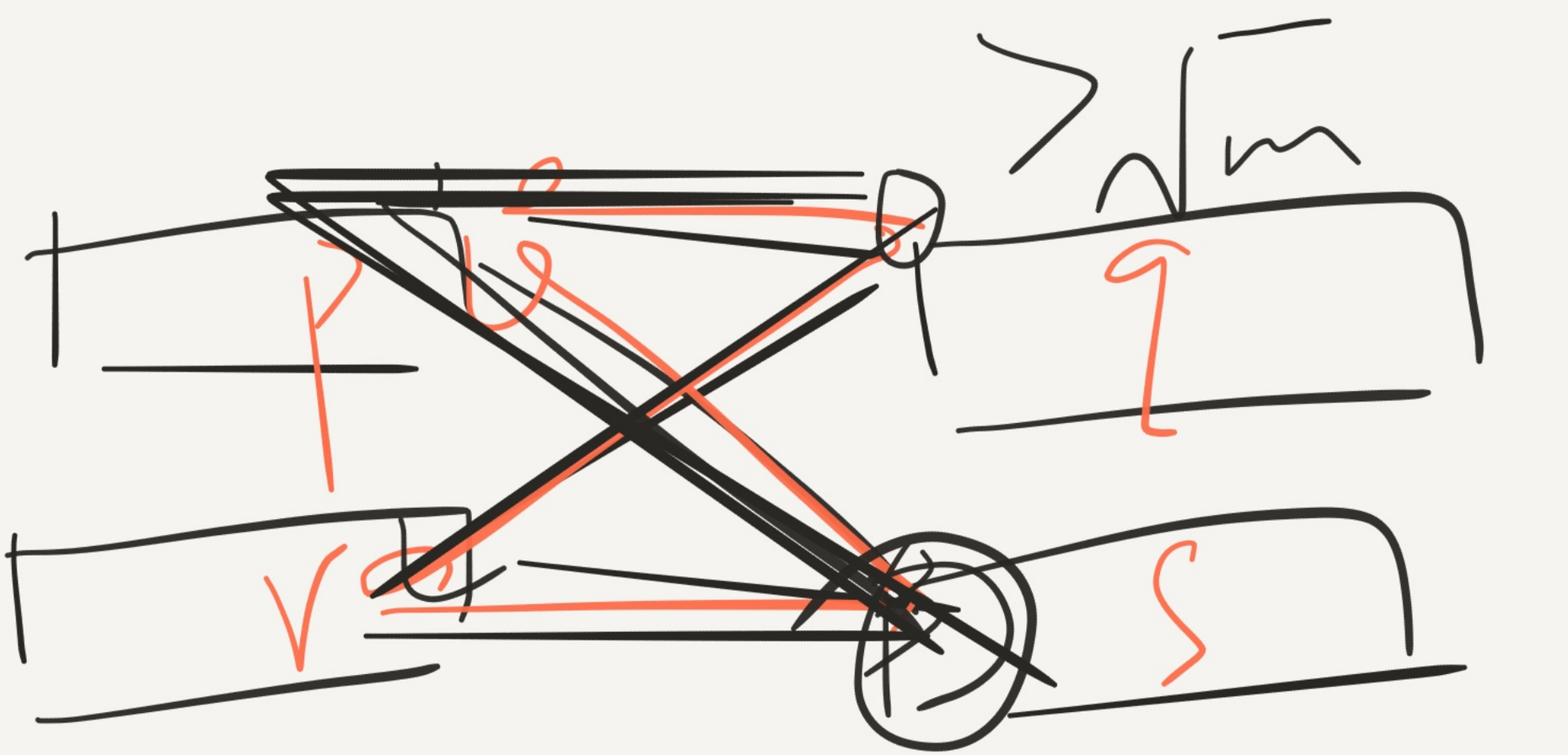

i
i+1
t(i,j)
t(i+1,j)
t(i+1,j+1)

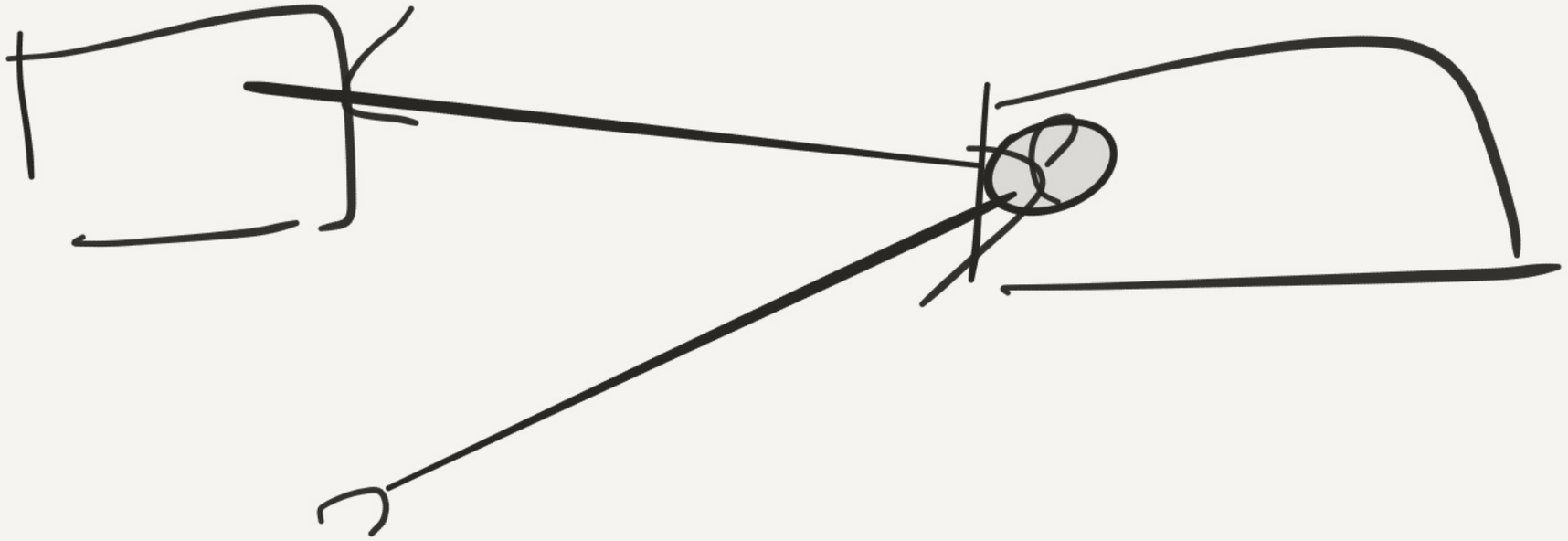


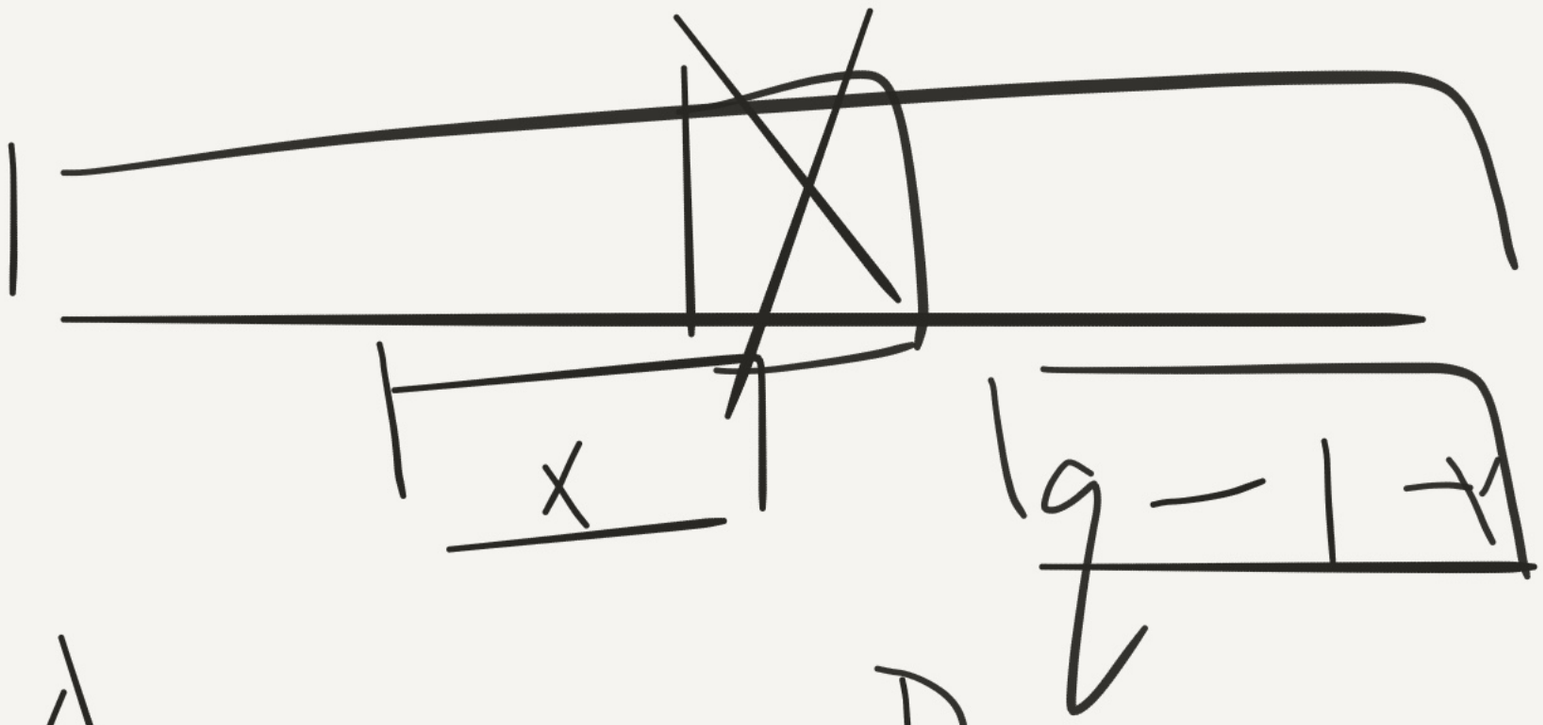




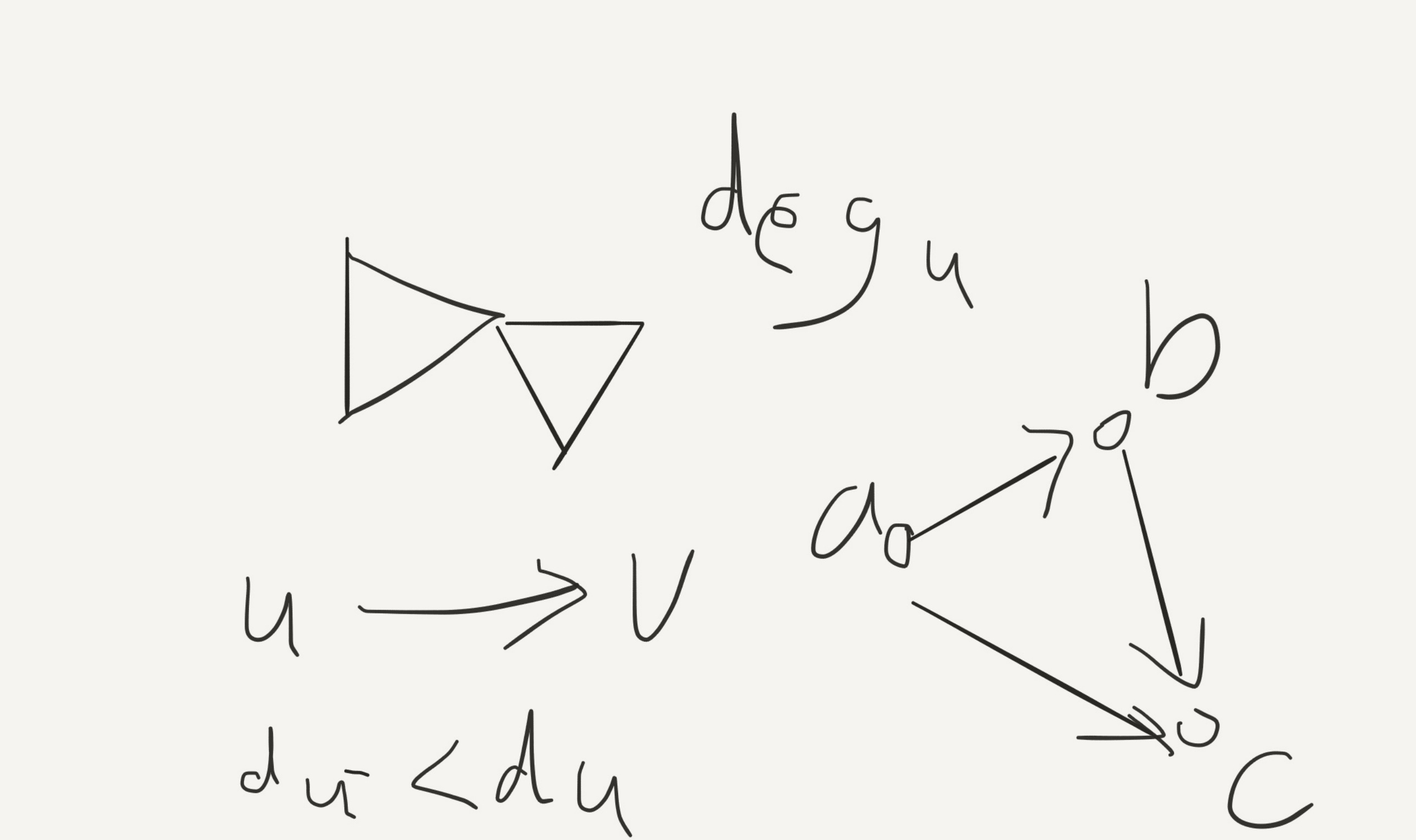




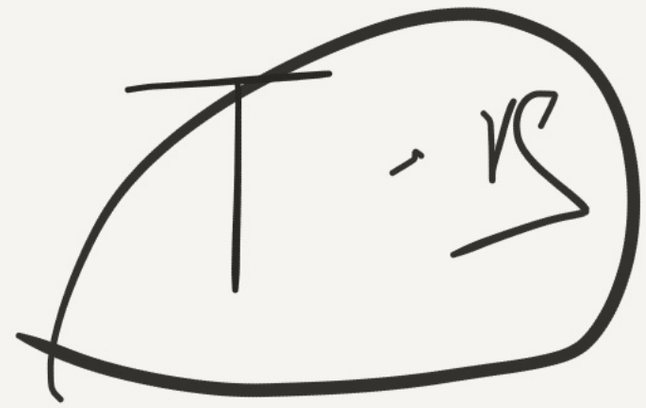


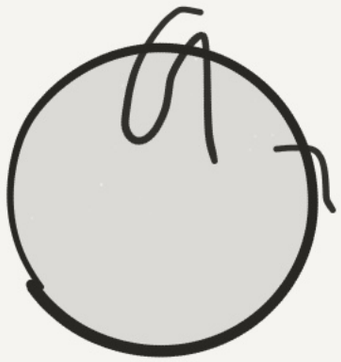


$(dfsA(i,1) \cdot dfsB(i,1))$


deg u
b
a
u
v
c
d u < d v

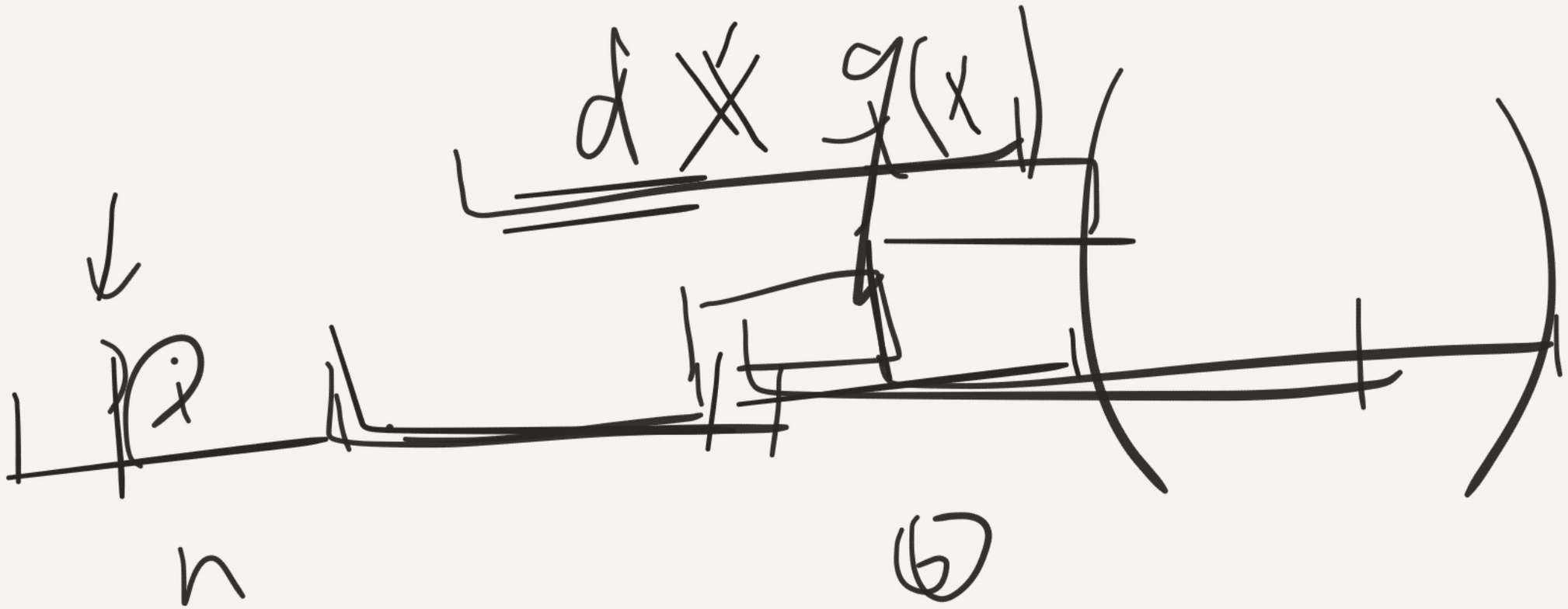
(a, b, c)



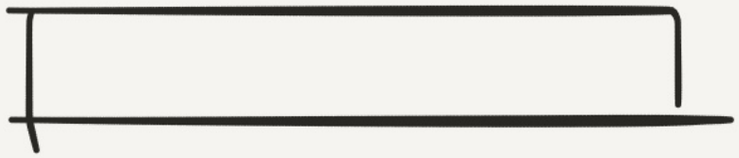


$a_i \cdot b_i \cdot c_i$

$a_j \; b_j \; c_i$

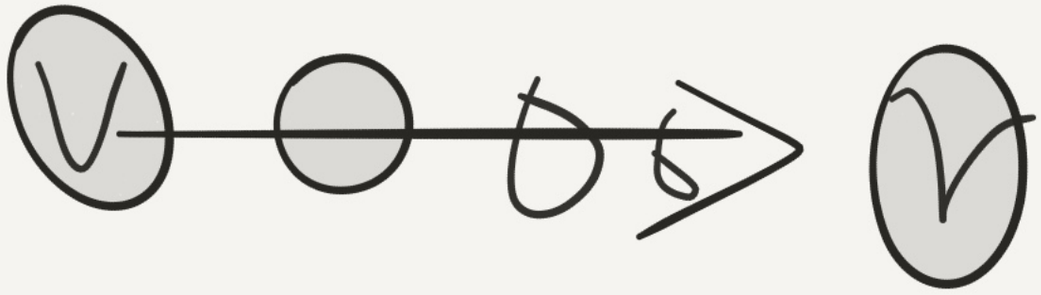

n
(b)

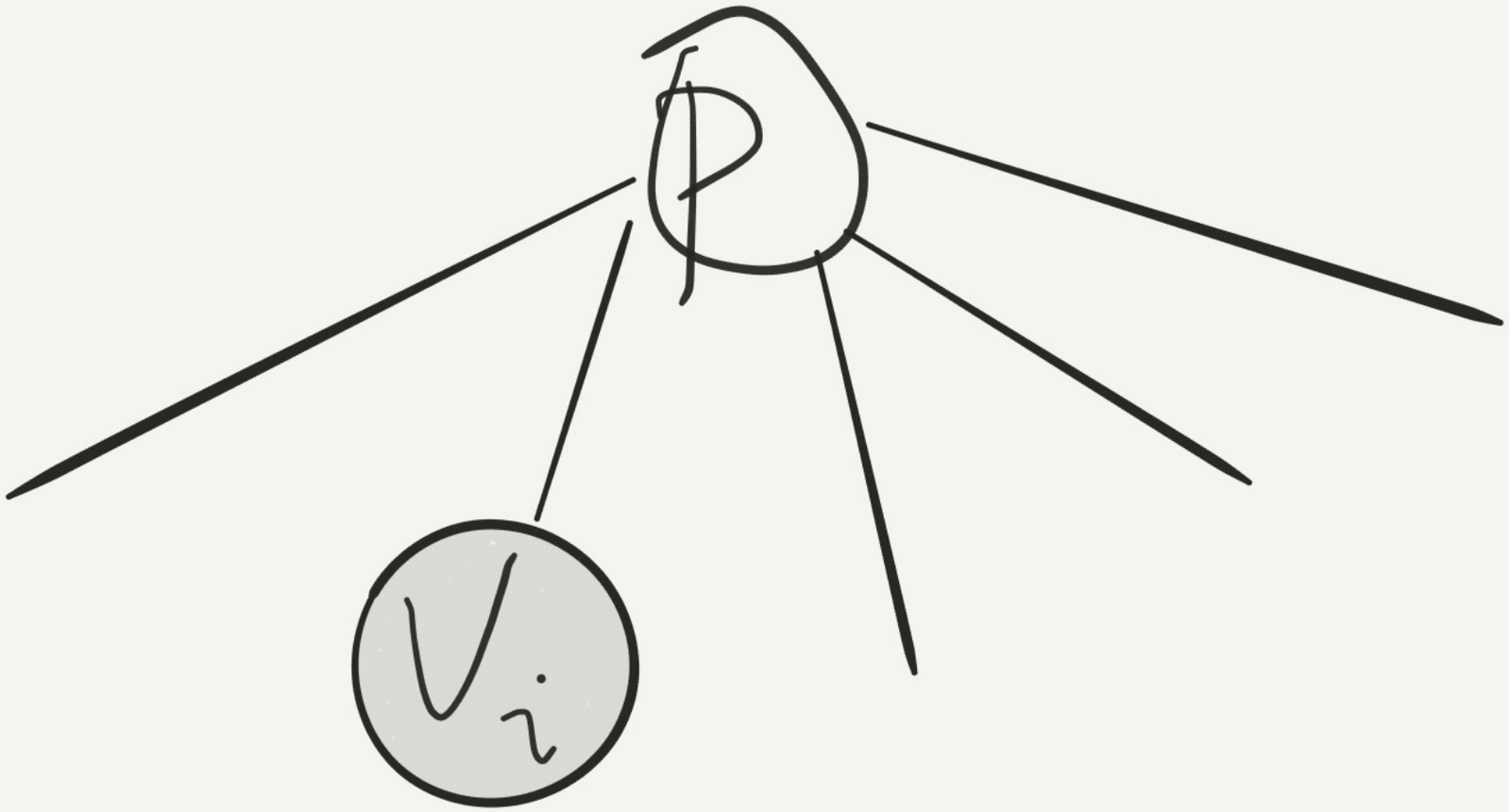
$t = cp$ $t' = pc$

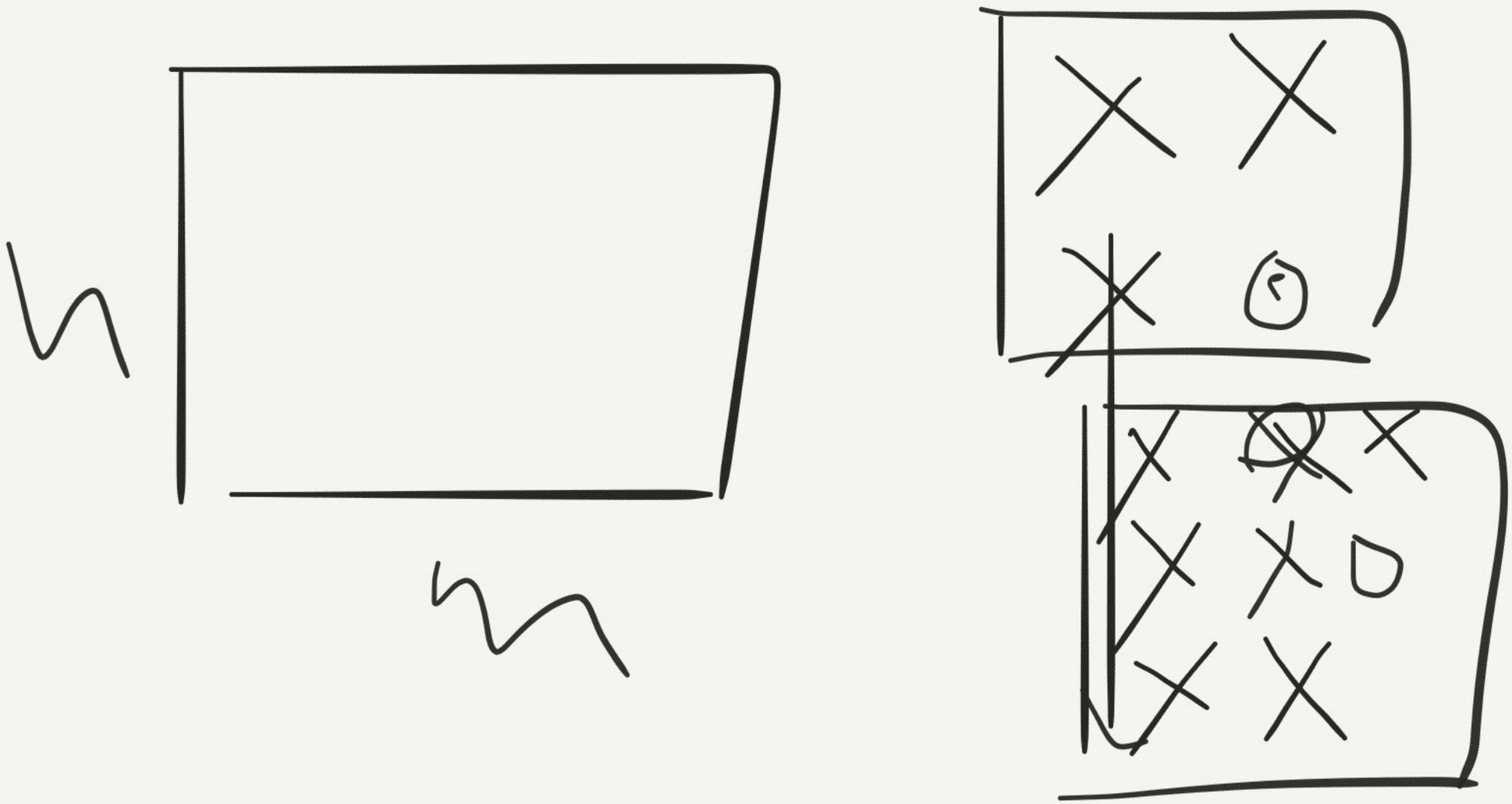


$$\gamma(w) = \min(r v_1, v_2)$$

$$d_\phi(u) = \binom{k_1 + k_2 + \cdots + k_r}{k_1, k_2, \ldots, k_v} \prod d_\phi(v_2$$

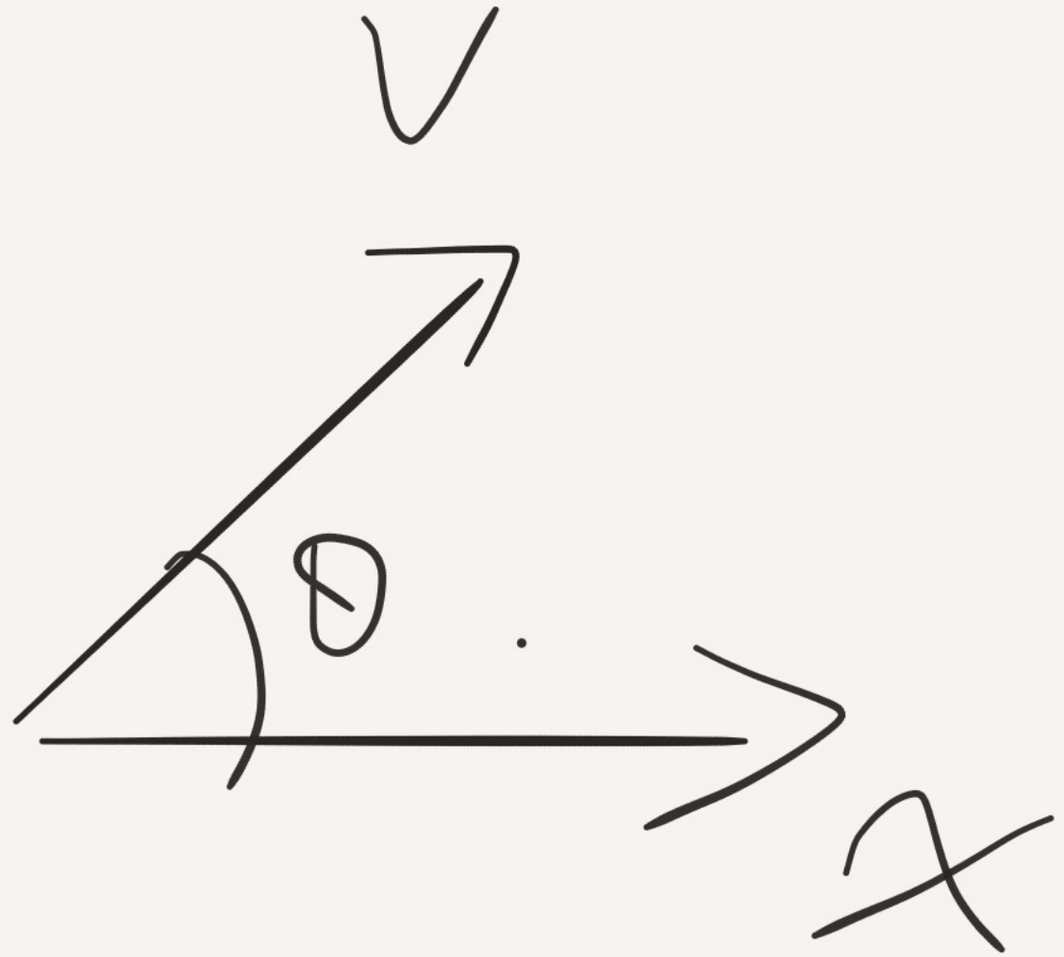


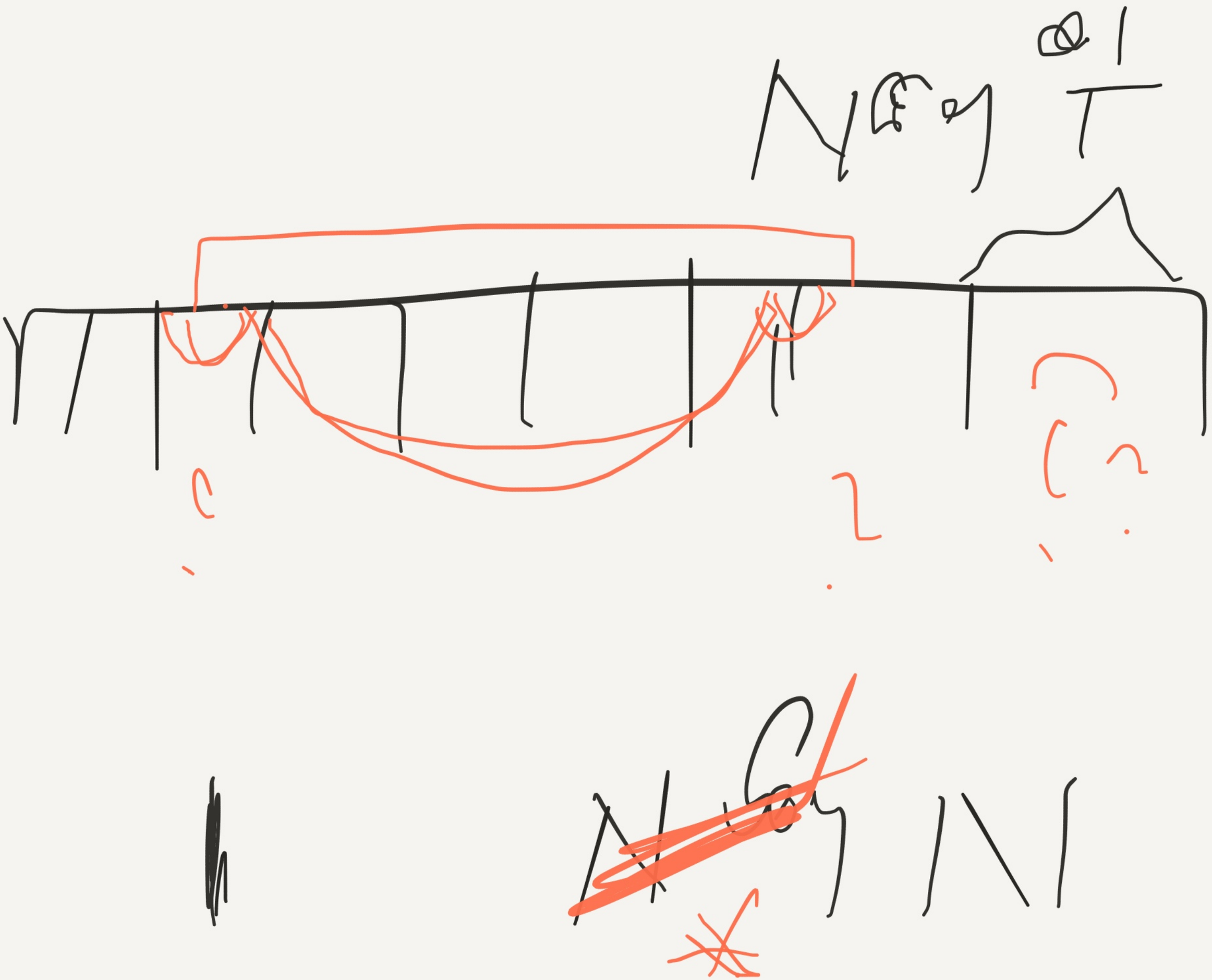

P
V_i

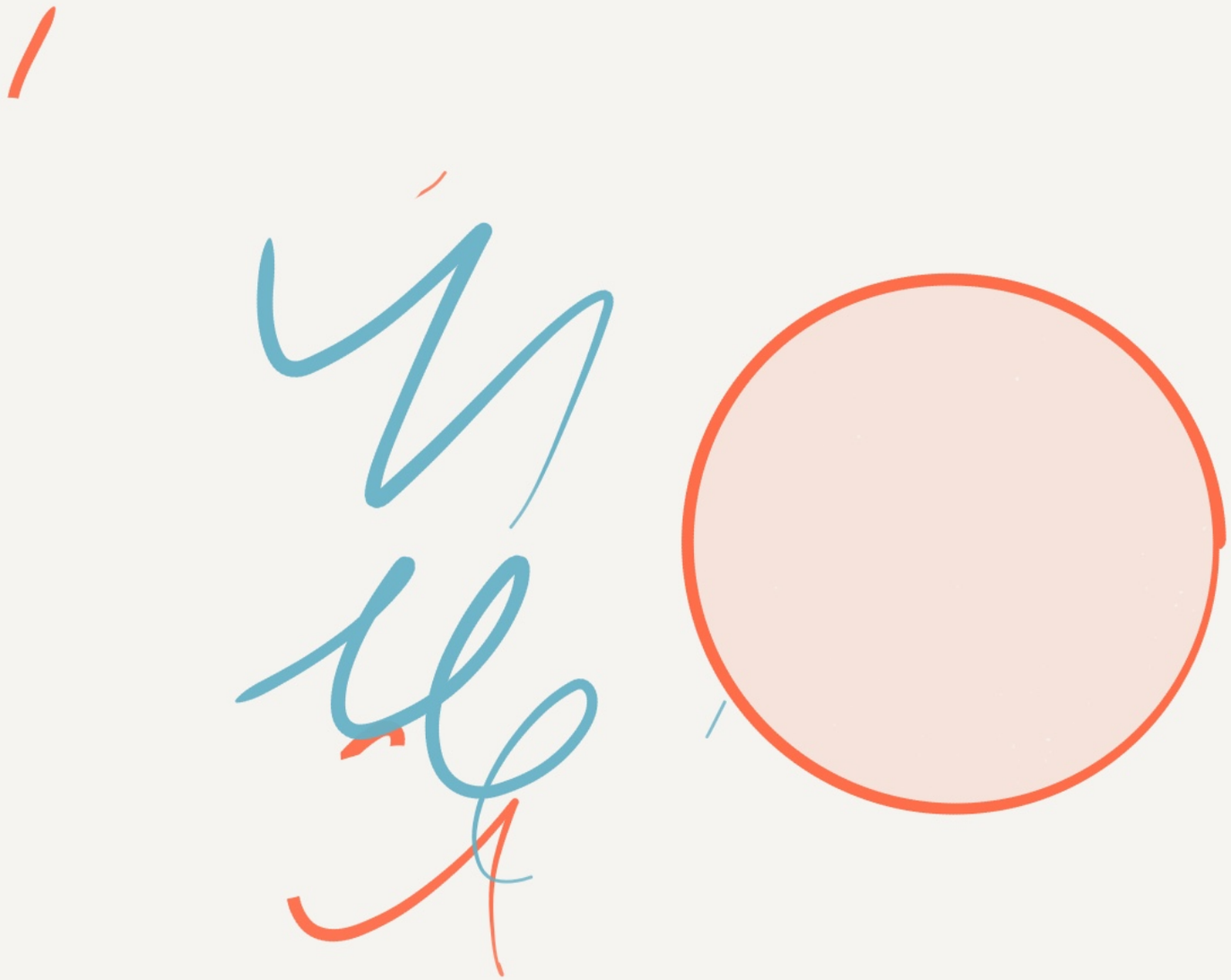


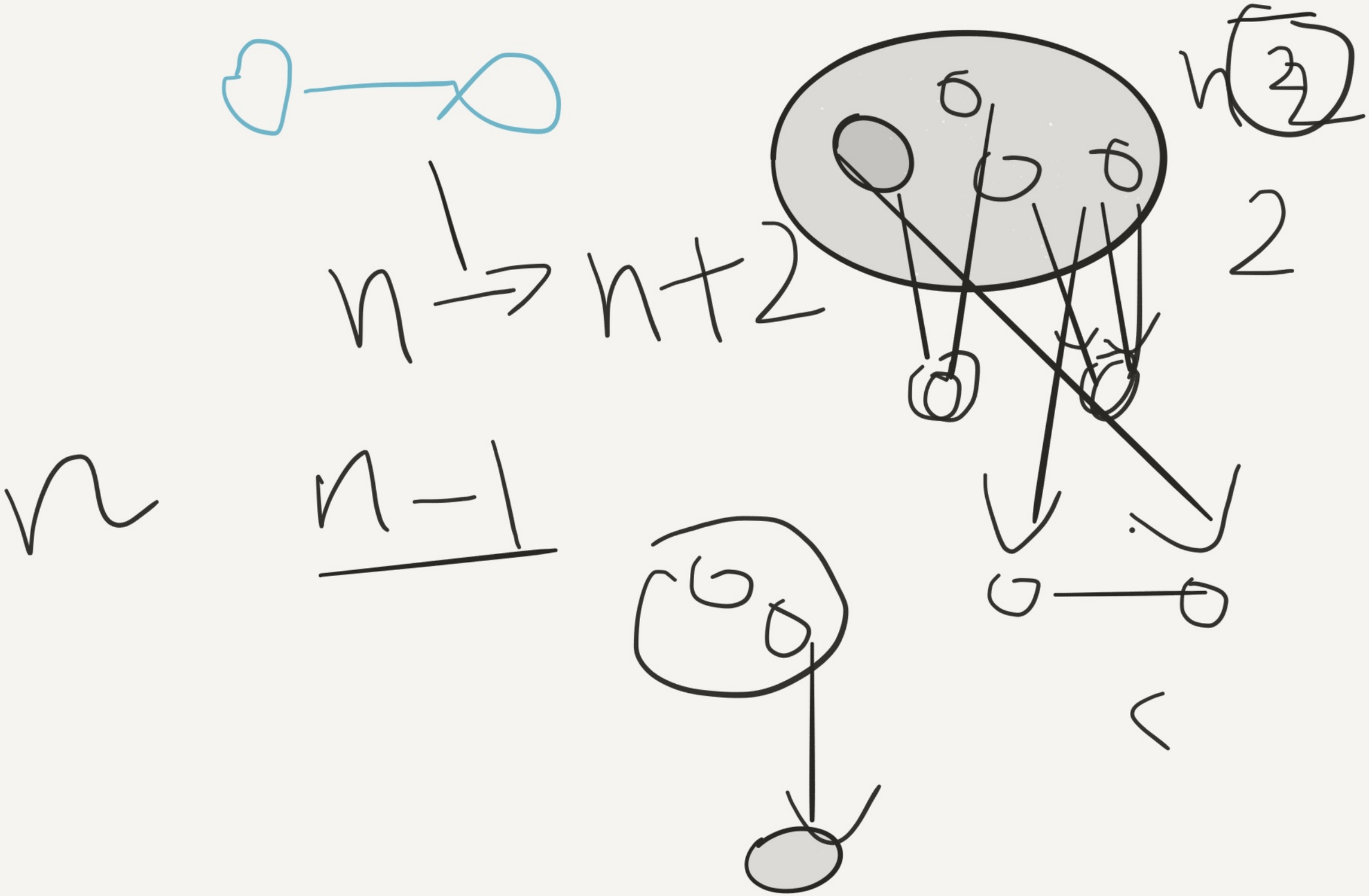
$$P_1, P_2, \ldots, P_k$$

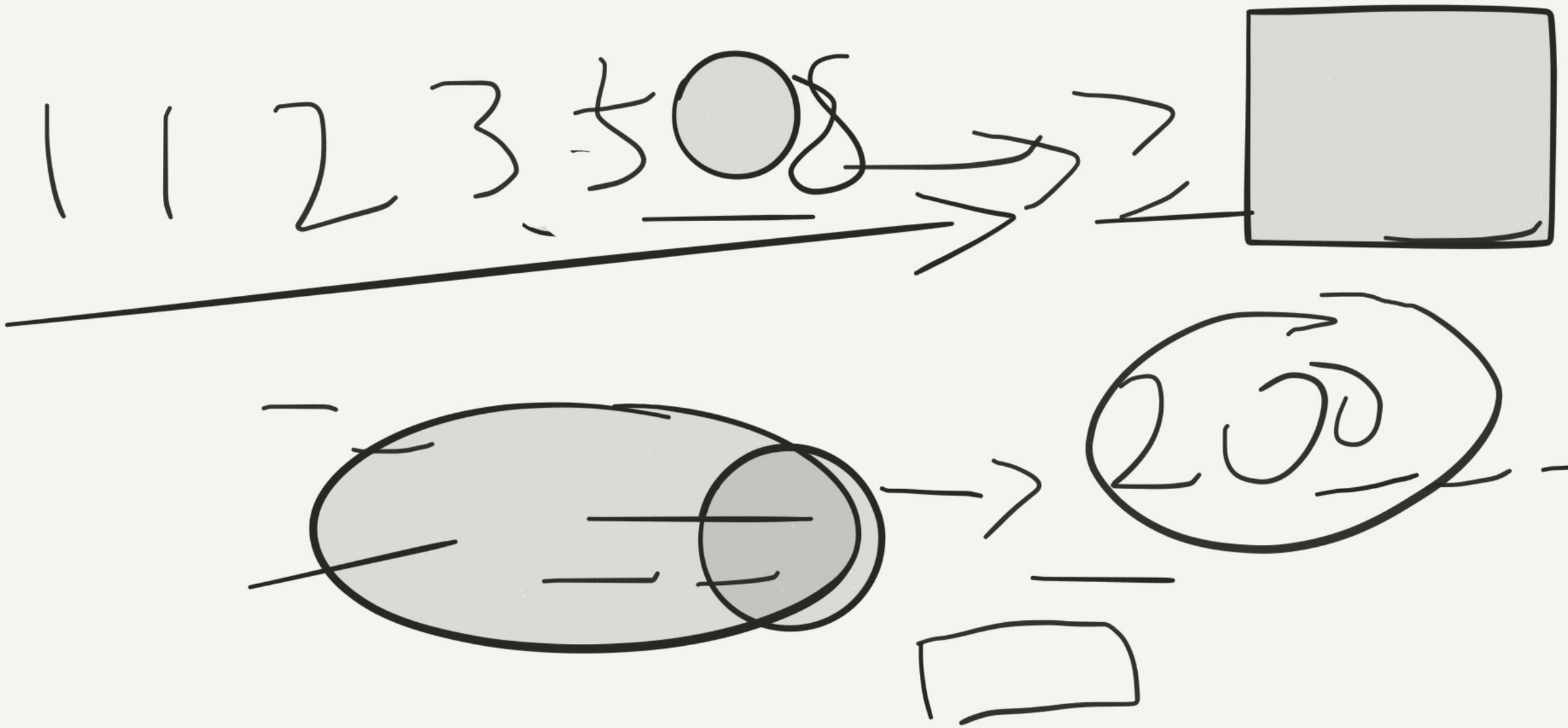
$$\sum (-1)^{|S|-1} \left(\prod_{i \in S} P_i \right)$$

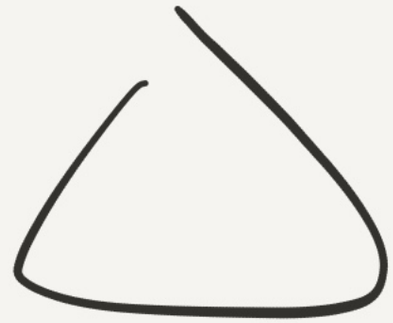

V
θ
x

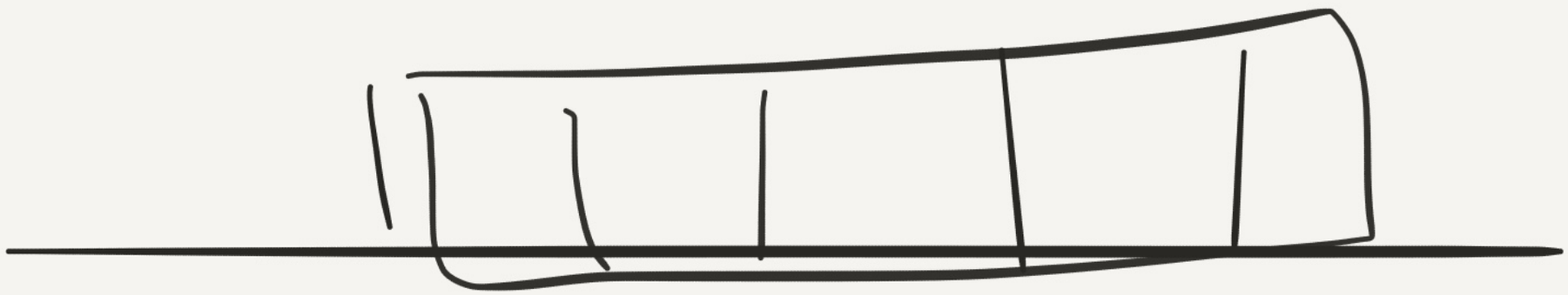


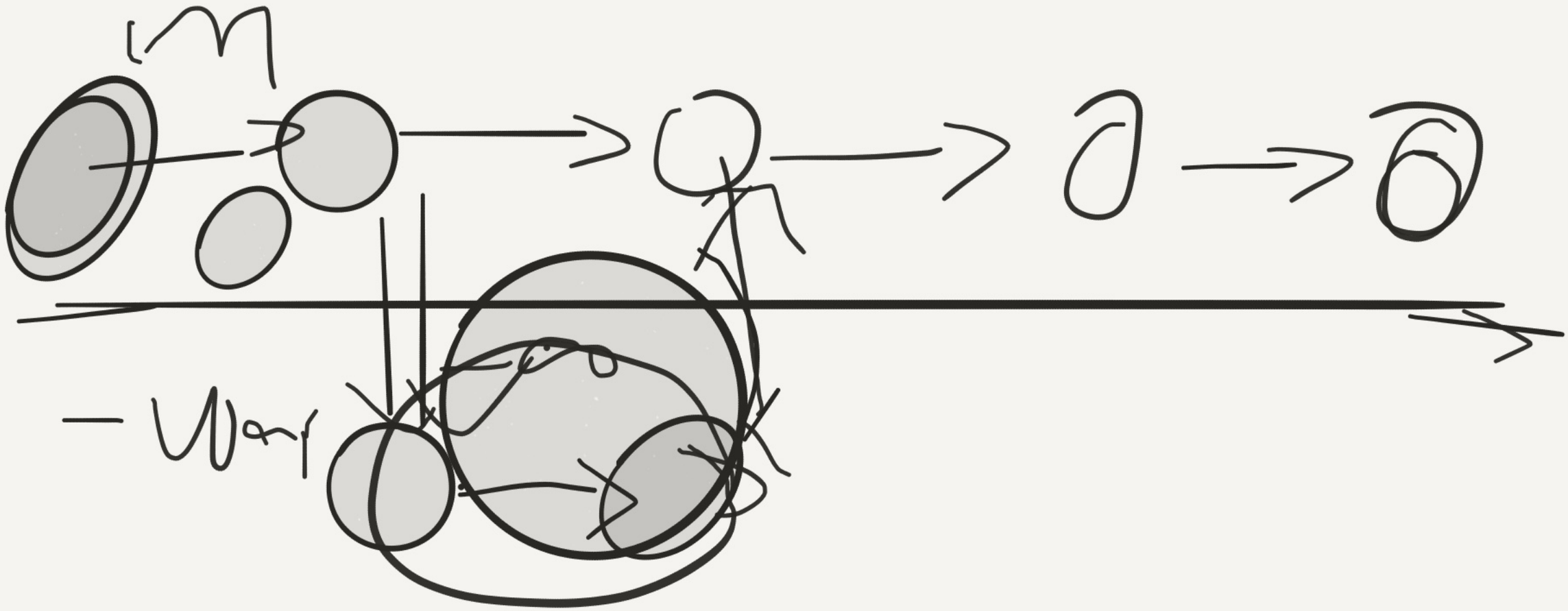



n
1
n+2
n-1
2
2


1 1 2 3 5 8
200







$$a + b = a \text{ XOR } b$$

$X_{n,k} \longrightarrow Y_{n,k}$

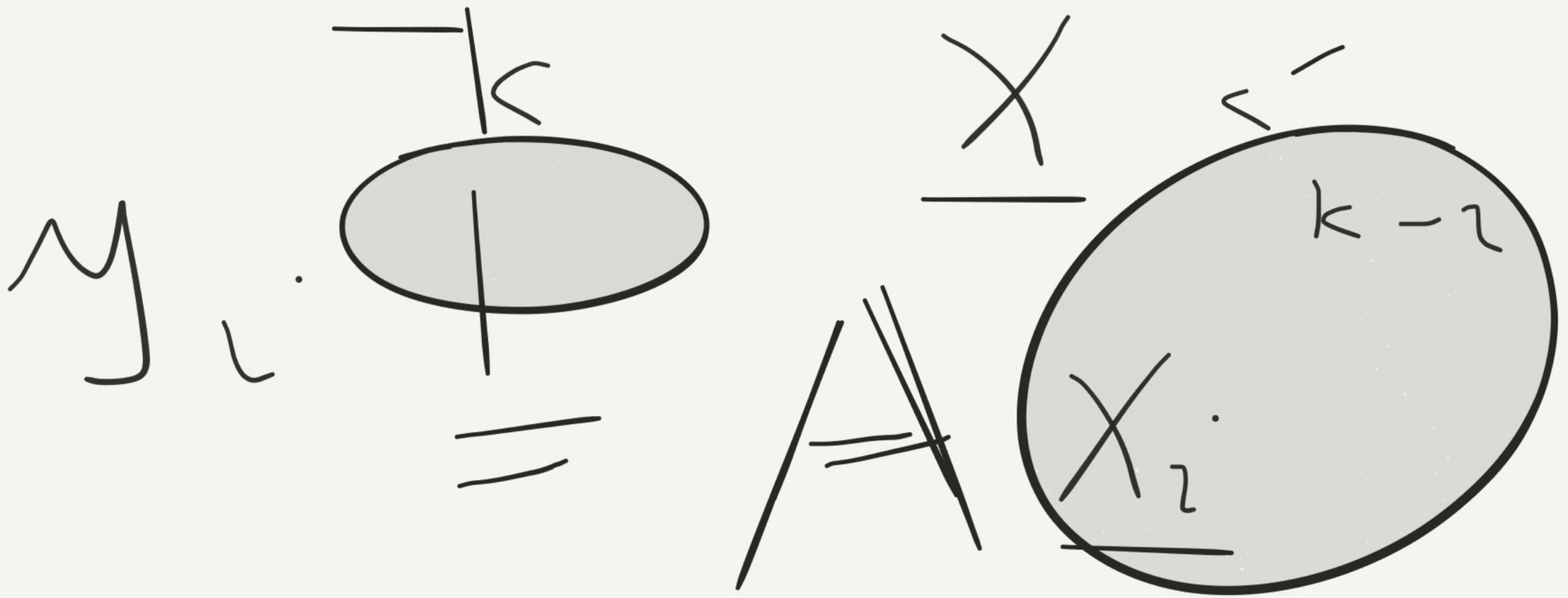
$X_{n,0}, \ldots, X_{n,k-1}$

$Y_{n,0}, \ldots, Y_{n,k}$ $k \geq 0$

$X_{n,k}$

$Y_{n,0}, \ldots \longrightarrow +\infty$

$f_{X_k}(x) = 2^{k-1}$



$$f[i][j] = n^3 \; n$$

$$\leq \frac{1}{i} \cdot \sum f(k-1)(j-1)$$

$$\frac{n^2 \log n O(\log n) \; k=1 \times f[i-k][j-1]}{O(\omega n \log n}$$

$S \qquad m = ks + r$

$$\frac{c_i k}{a} + \left\lfloor \frac{c_i r}{s_i} \right\rfloor \geq b_i$$

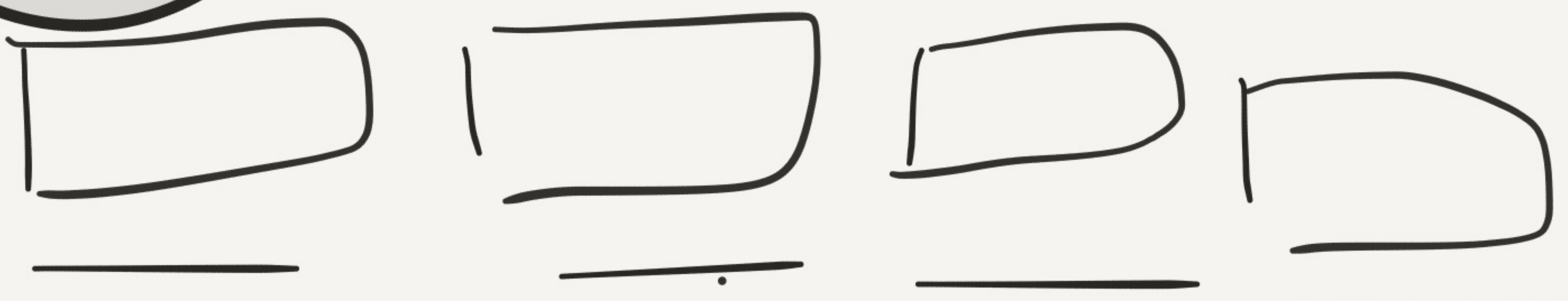
$b = 2^{31}$

50

20 80%

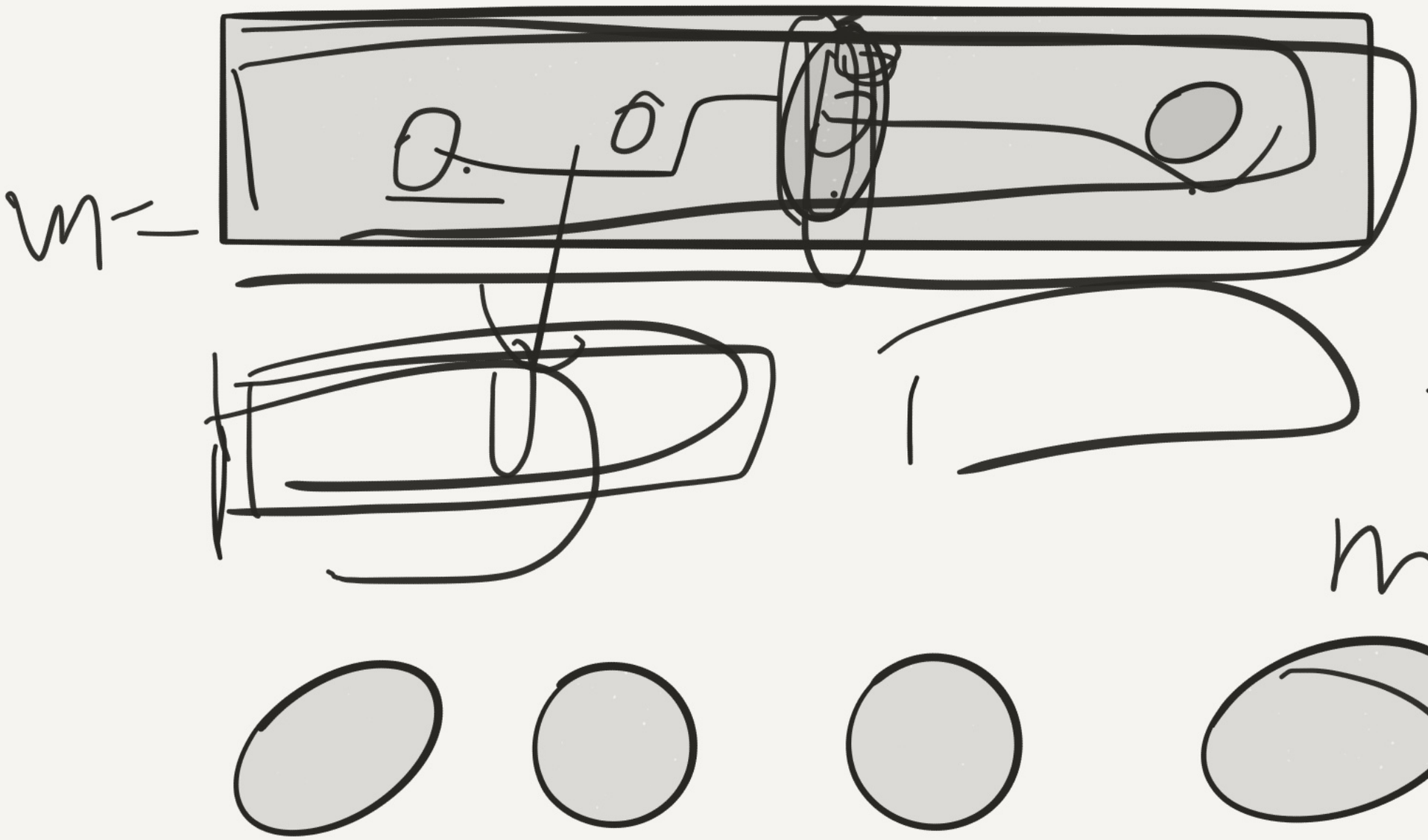
210 0 49

120



$2^7 = 128$

J S[1] k



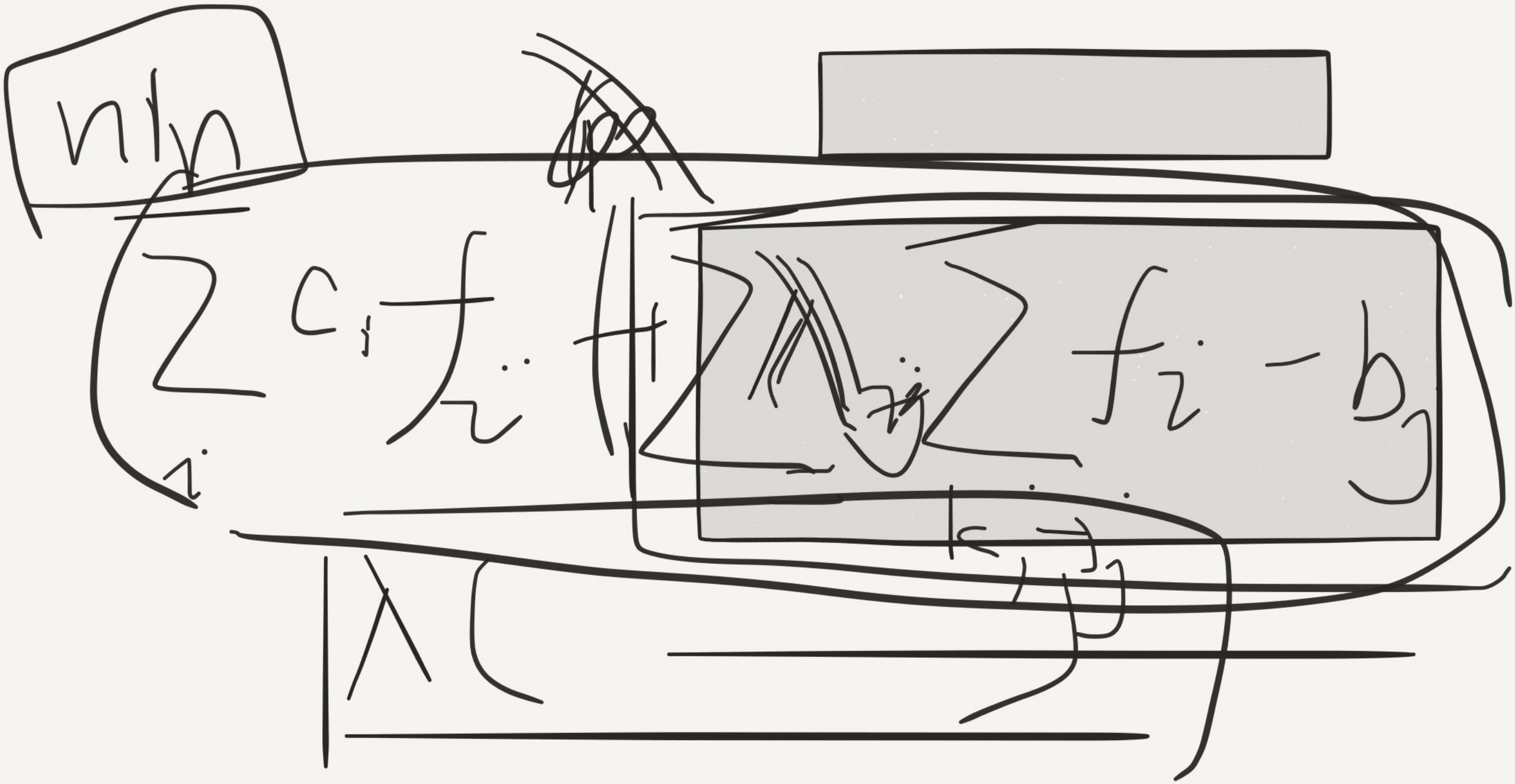
$m \cdot \log^2 n$

$m \log n$

$\xi \geq b,$

$f_v \in \{0, 1\}$

$$\max \left[\min \left(\sum_{i} (c_i + \lambda) f_v \right) - \sum \lambda_{ij} b_{ij} \right]$$

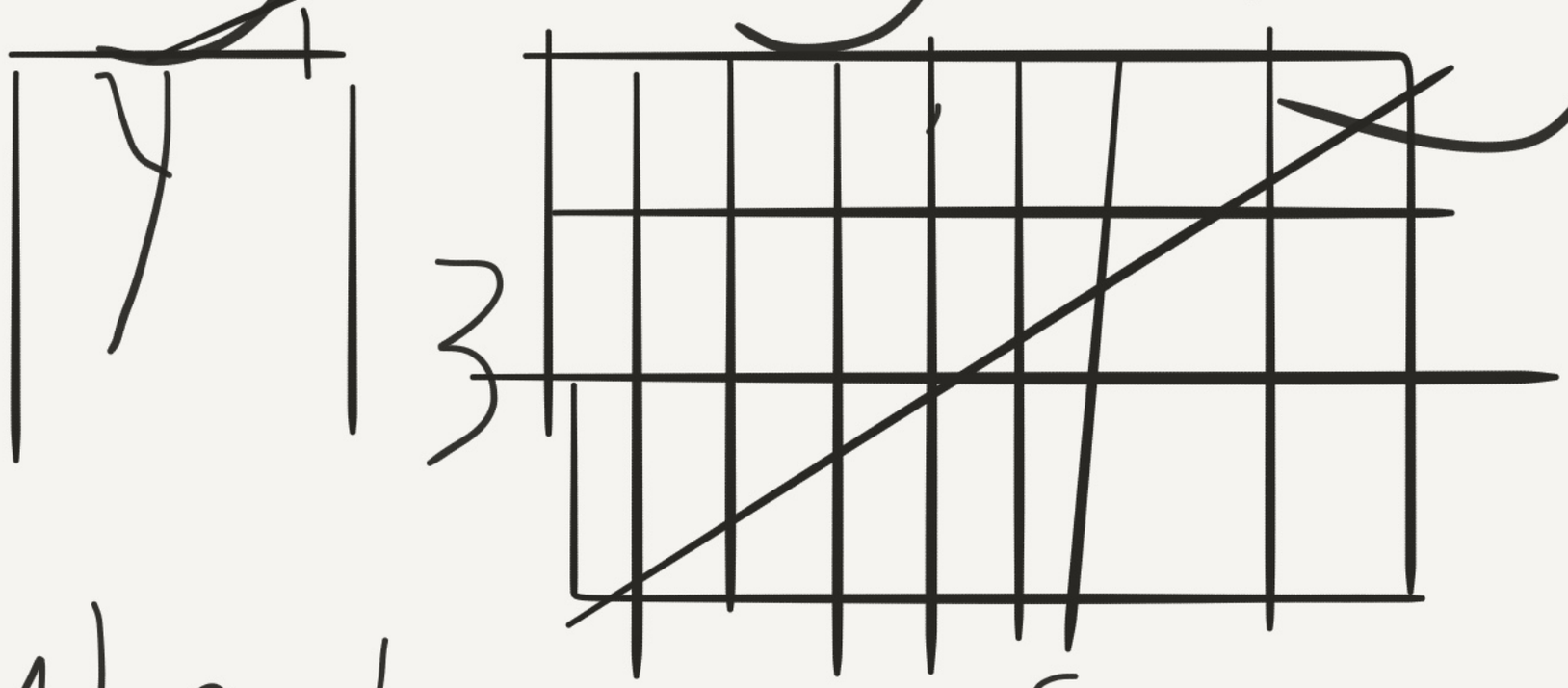


$$\sum_{i=1}^{n} \sum_{j=1}^{m} c_{ij} f_{ij}$$

$$\sum_{j=1}^{m} f_{ij} \le b_i \quad \min$$

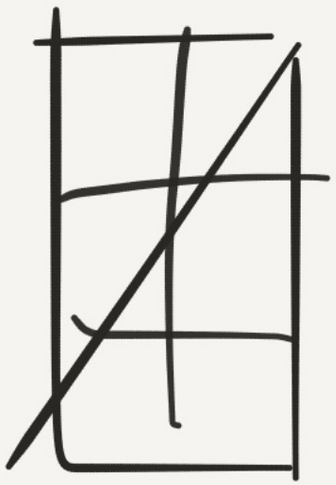
$$b_i \ge 0$$

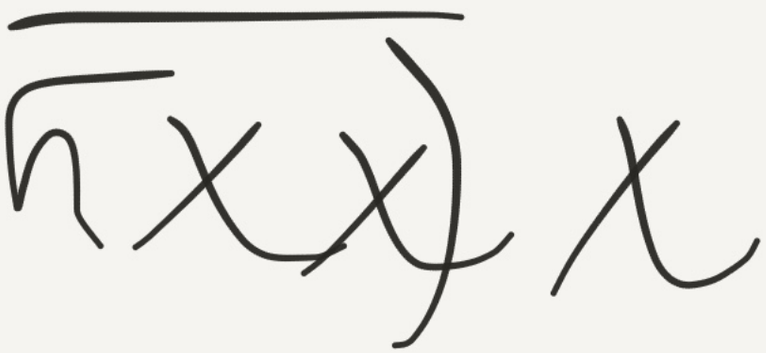
xxxyxxxyxxy



x(xxy) x(xxy) xxy

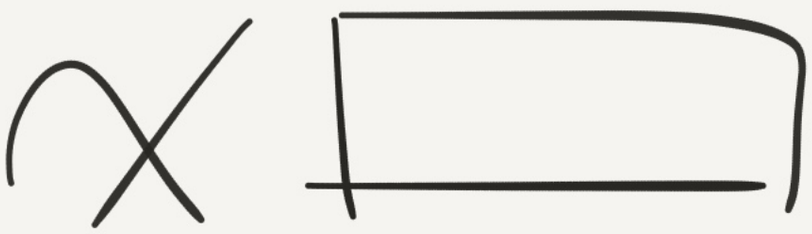
$p^r = \{1, 2, \ldots, 4\}$

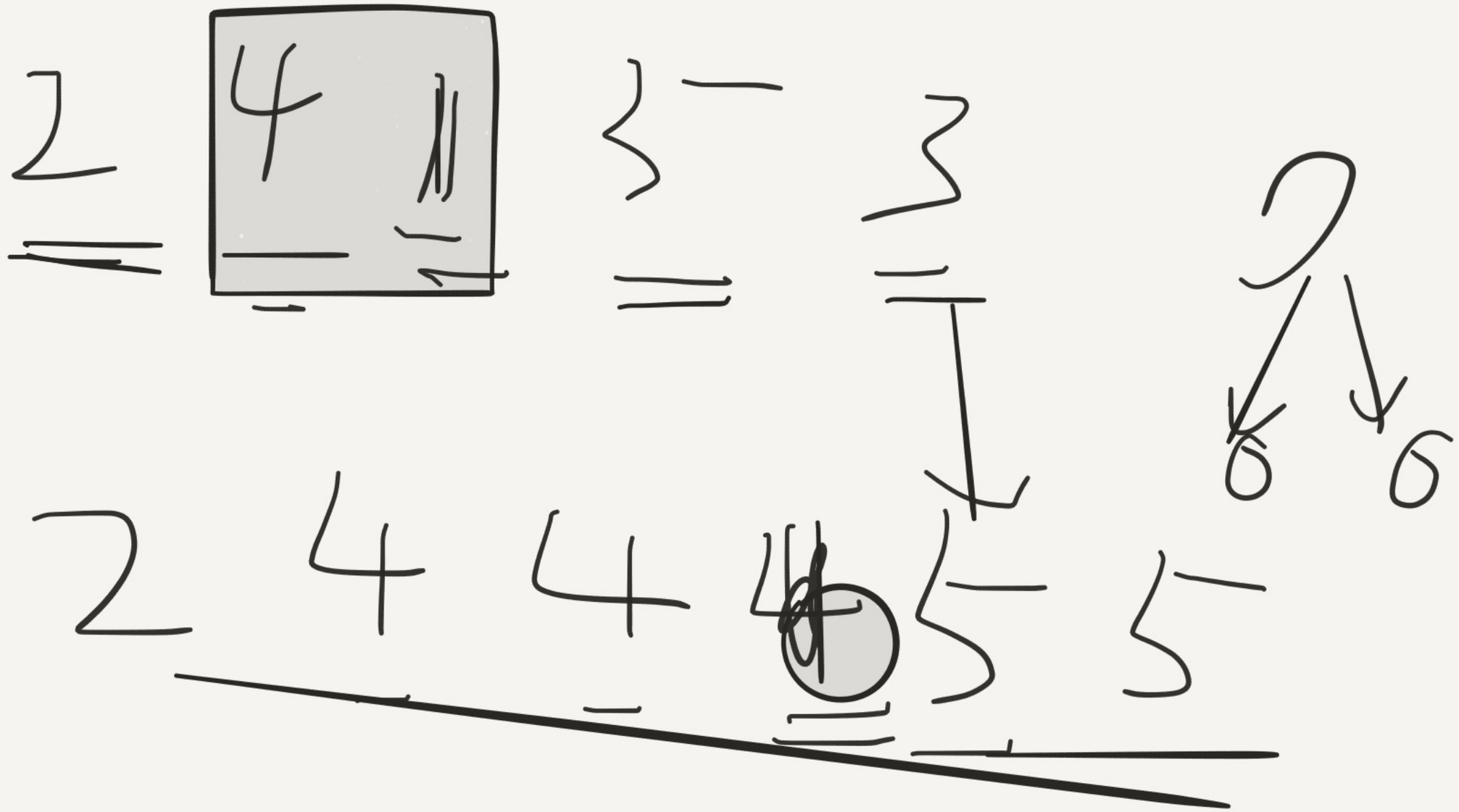


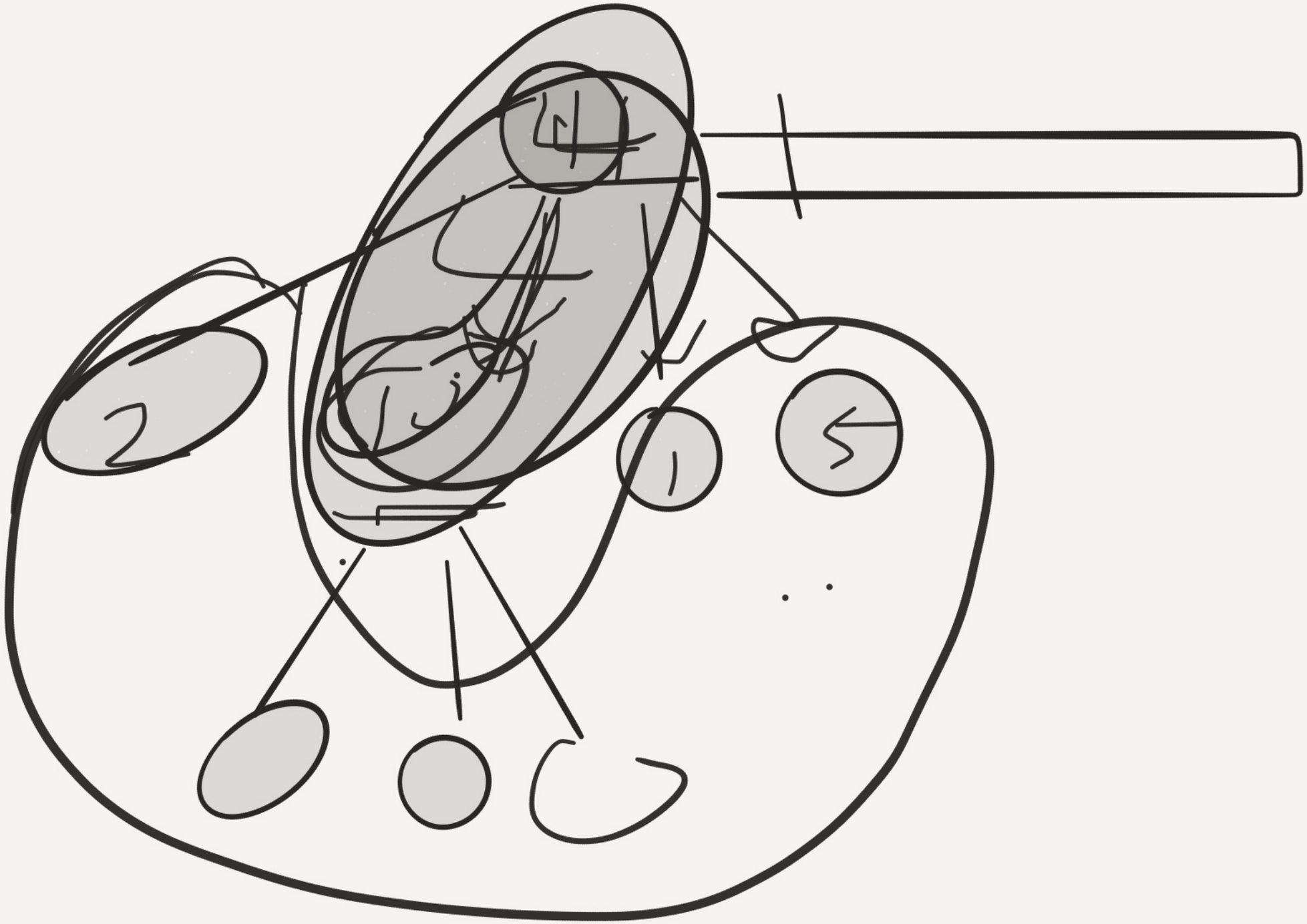


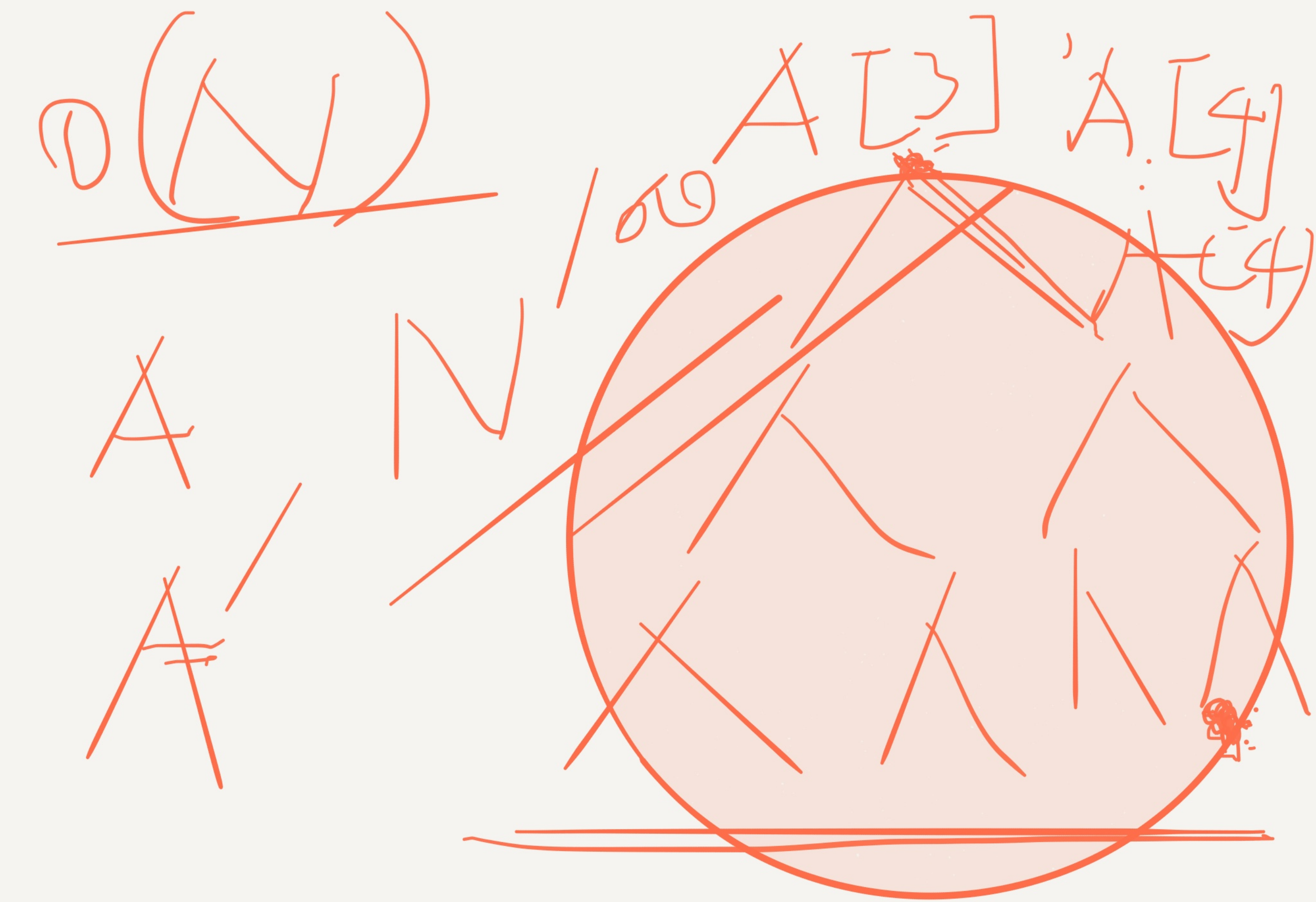
$$(a,b) \Rightarrow (a \circ \lambda b.b)$$

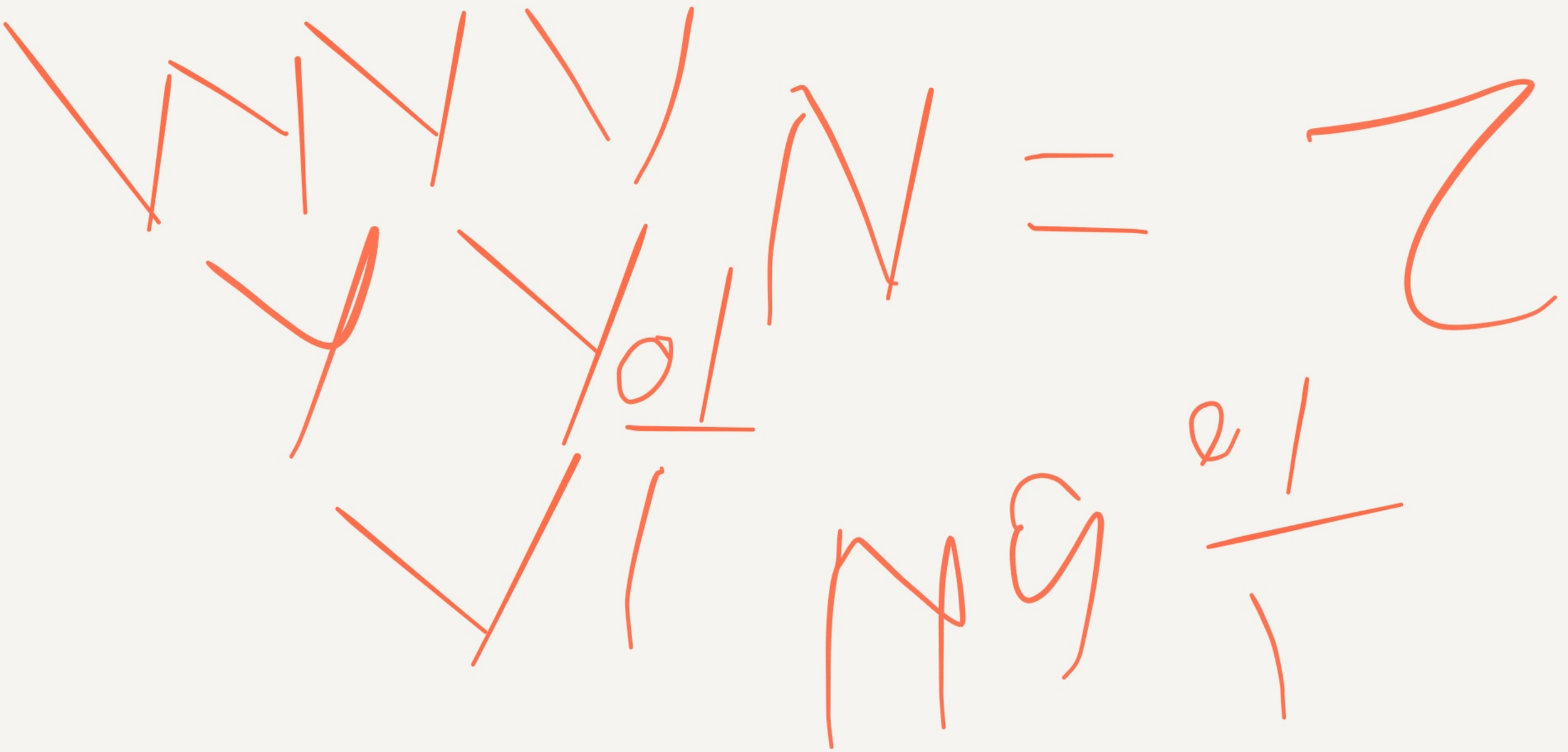
$$\Rightarrow (a, b \circ \lambda a)$$

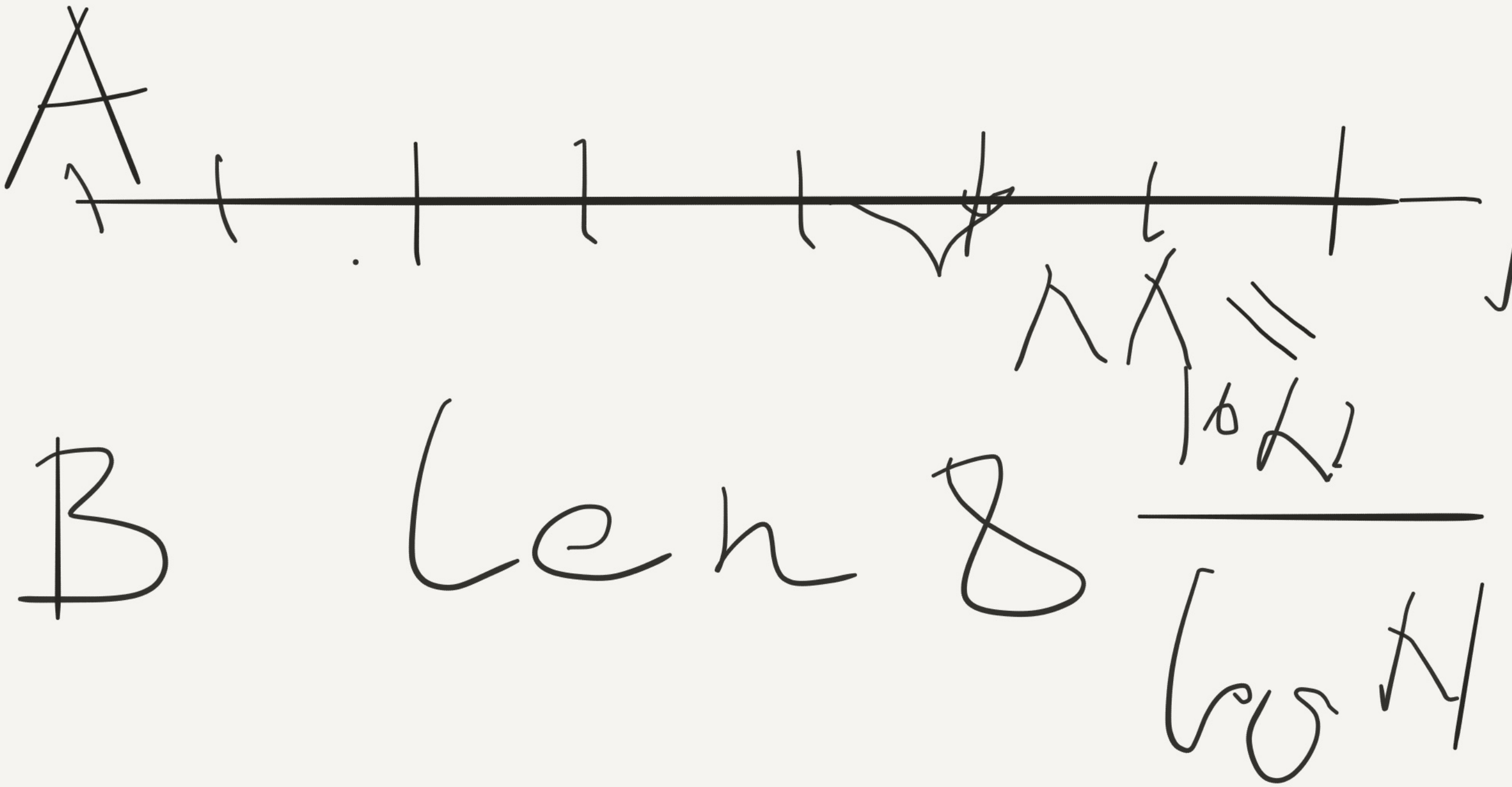












$$= \frac{\log N}{\log N}$$