

$$p = \frac{\exp(\underline{w} \cdot \phi(x, y))}{\sum_{y'} \exp(\underline{w} \cdot \phi(x, y'))}$$

$$L = \sum_i \log p(y_i | x_i; \underline{w})$$

$$\frac{\partial L}{\partial \underline{w}} = \sum \left( \frac{1}{p} \cdot \right)$$

$$\underline{\sum \partial (w \phi - \log(\sum_{y'} \exp(w \phi)))}$$

$$= \sum (\phi_j -$$

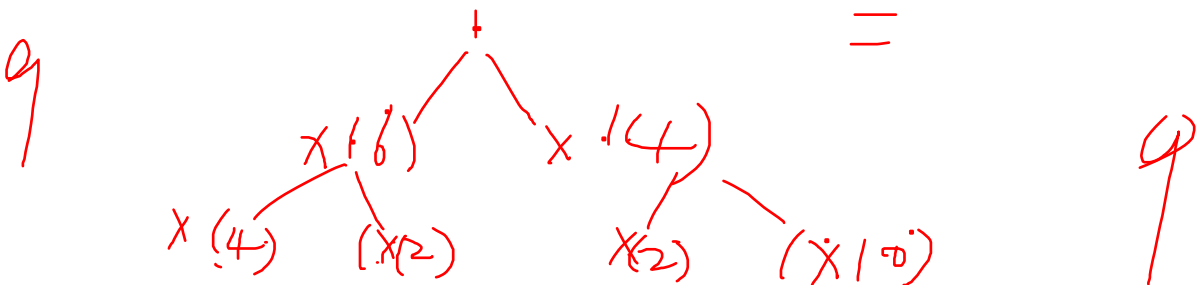
$$\begin{aligned}
 & \log \sum_{y'} (\exp(w\phi)) \\
 &= \frac{\sum_{y'} \exp(w\phi) \cdot \phi_j}{\sum_{y'} \exp(w\phi)} \\
 &= P(\phi_j)
 \end{aligned}$$

```

static int x(int n)
{
    if (n <= 3)
        return 1;
    else
        return x(n - 2) + x(n - 4) + 1;
}

```

x(8)  
=



$$\bar{I}/u^S = S \cdot id$$

$$V = U \oplus U^2 \oplus \dots \oplus U^k$$

$$\rightarrow \text{II} \quad I([a, b]) = [I(a), b] + [a, I(b)]$$

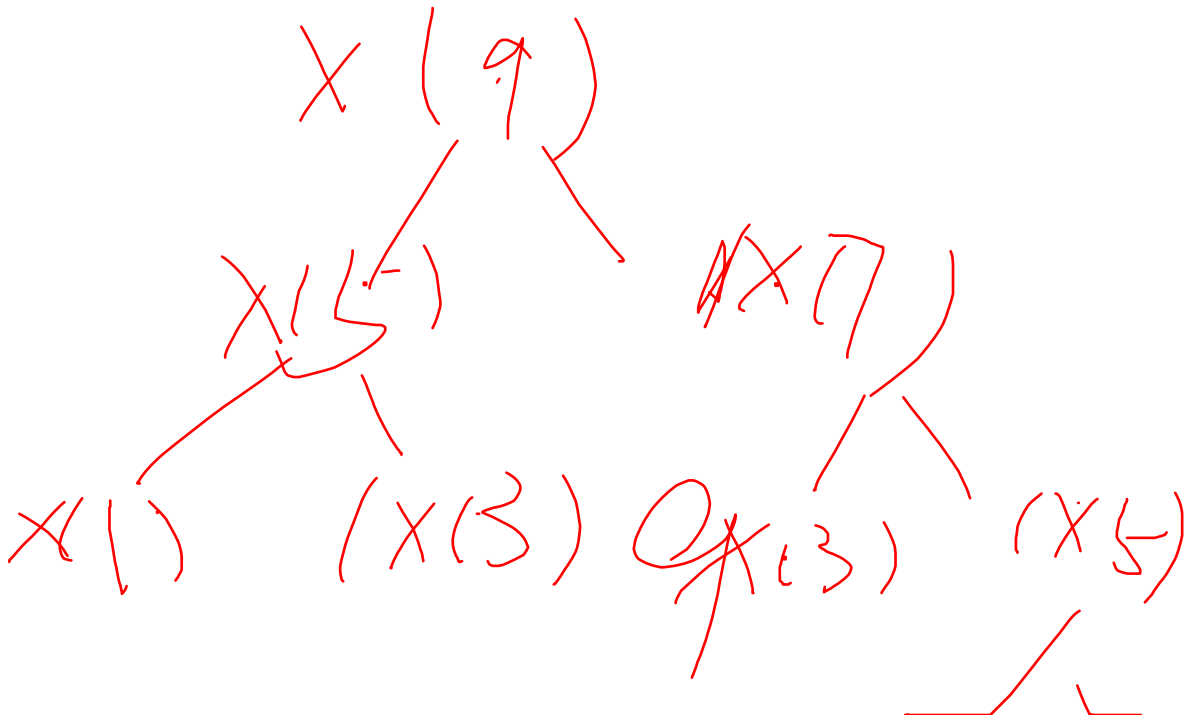
$$a \in U^{a_1}$$

$$b \in U^{a_2}$$

$$\cancel{\mathbb{Z}} \quad a \in U^2$$

$$([u, u], u) \in u^3$$

$$[ [u, u], [u, u] ]$$



X(11) (13)

$$g = c'(y) \oplus v$$

$$z(y) = c'(g) \oplus u$$

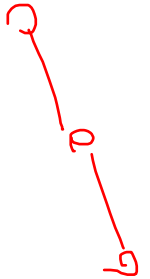
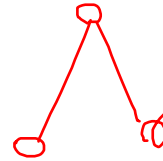
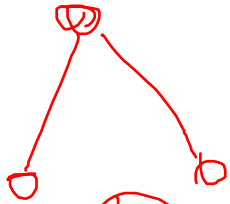
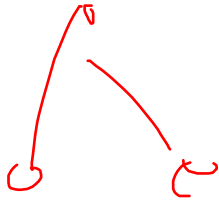
$$g = c(g) \oplus u \oplus w$$

$$h \stackrel{\Delta}{=} c'(y) \oplus w$$

$$z(h) = c'(g)$$





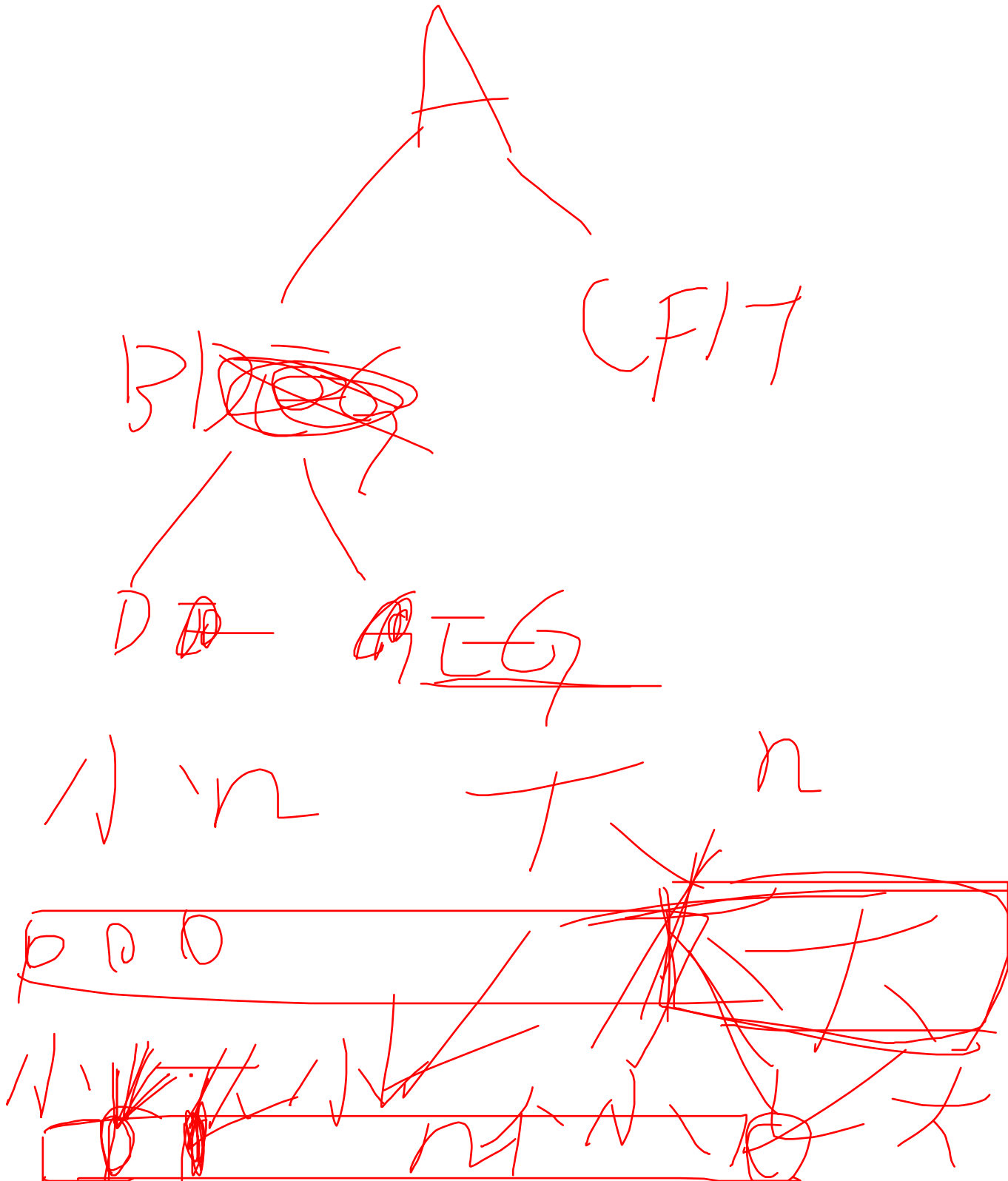


① 左 右

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$$n! \times (n) \times (n-1)$$

$$n = 2 \quad \checkmark$$

$$n = 4$$

~~A B~~

C D

① 6

② 2

③ 12

A B C D

~~2 x 2 x 2~~

$$\textcircled{4} \quad 5! / 2! = 3 \times 4 \times 5 = 60$$

$$\cancel{1000} = \cancel{1000}$$

~~$= 499 + 500$~~

~~$\frac{1}{\sqrt{2}} \begin{pmatrix} 1 & i \\ 0 & 1 \end{pmatrix}$~~

$$= 51$$

= 13

---

---

$$2 \sqrt{100} =$$

$$2 \quad \boxed{5 \rightarrow 0} = 5 \times 5 \times 4 = 100$$

$1000 = 2 \times 5 \times 100$

$128$

$1 \quad 5 \quad 5 \quad 5 \quad 5$

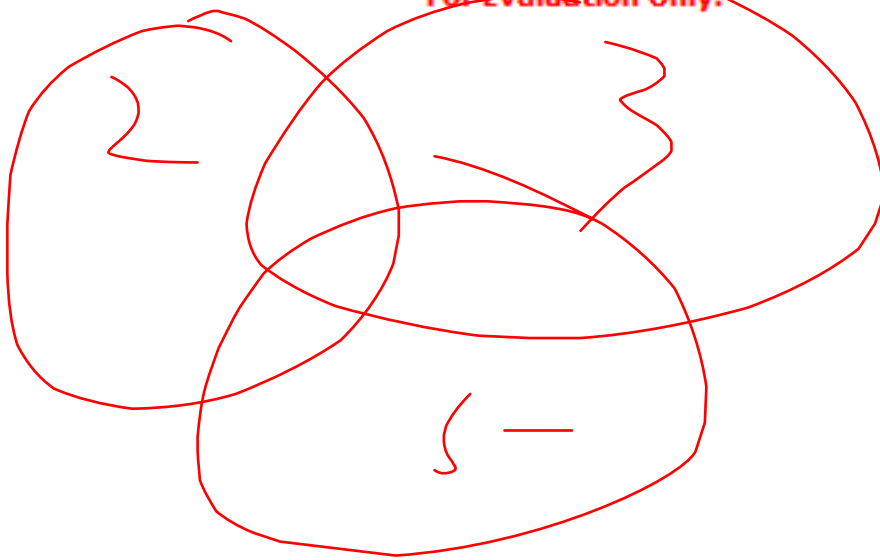
$2 \quad 3 \quad 5$

$2042$

$2^0 \quad 3^0 \quad 5^0$

$X \quad 1 \sim X \quad 10 \quad 10 \quad 10 \quad 10$

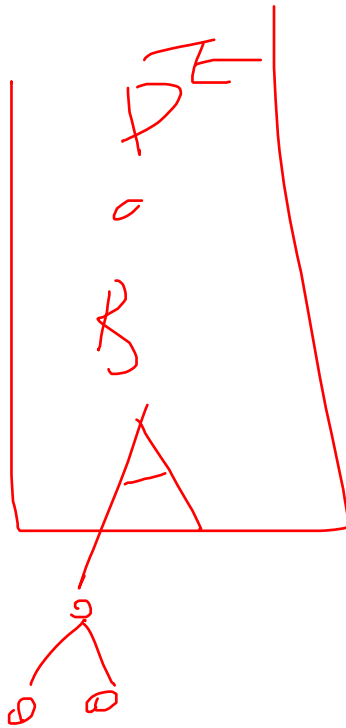
$2 \frac{1}{10} \quad 3 \frac{1}{10} \quad 5 \frac{1}{10} - 6 \frac{1}{10} - 15 \frac{1}{10}$



$$20 \ 40 \text{ — } \overline{10}$$

$$\begin{aligned} & 1020 + 680 + 408 \\ & - \{40 + 1\} 6 - 204 + 68 \\ & = 1496 \quad 20 \ 40 \end{aligned}$$

$$\begin{aligned} & 2042 \quad 2043 \quad 2044 \\ & \quad \quad \quad \underline{2045} \end{aligned}$$



$$360$$

$$1 + 2 + 4$$

$$2^0 + 2^1 + \dots + 2^8 = 360$$

$$2^{n+1} - 1 = 360$$

$$2 \left( 36 \mid \frac{n+1=9}{n=8} \right)$$

180.5

$$2^3 = 8$$

$$2^6 = 64$$

$$2^7 = 128$$

$$2^8 = 256$$

$$2^9 = 512$$



100

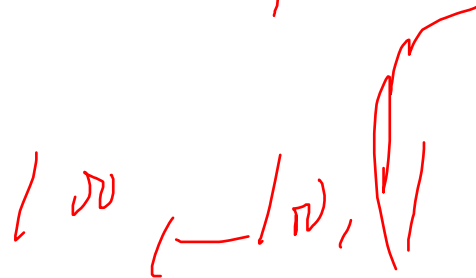
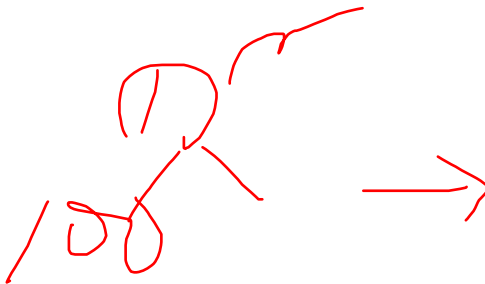
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100

|

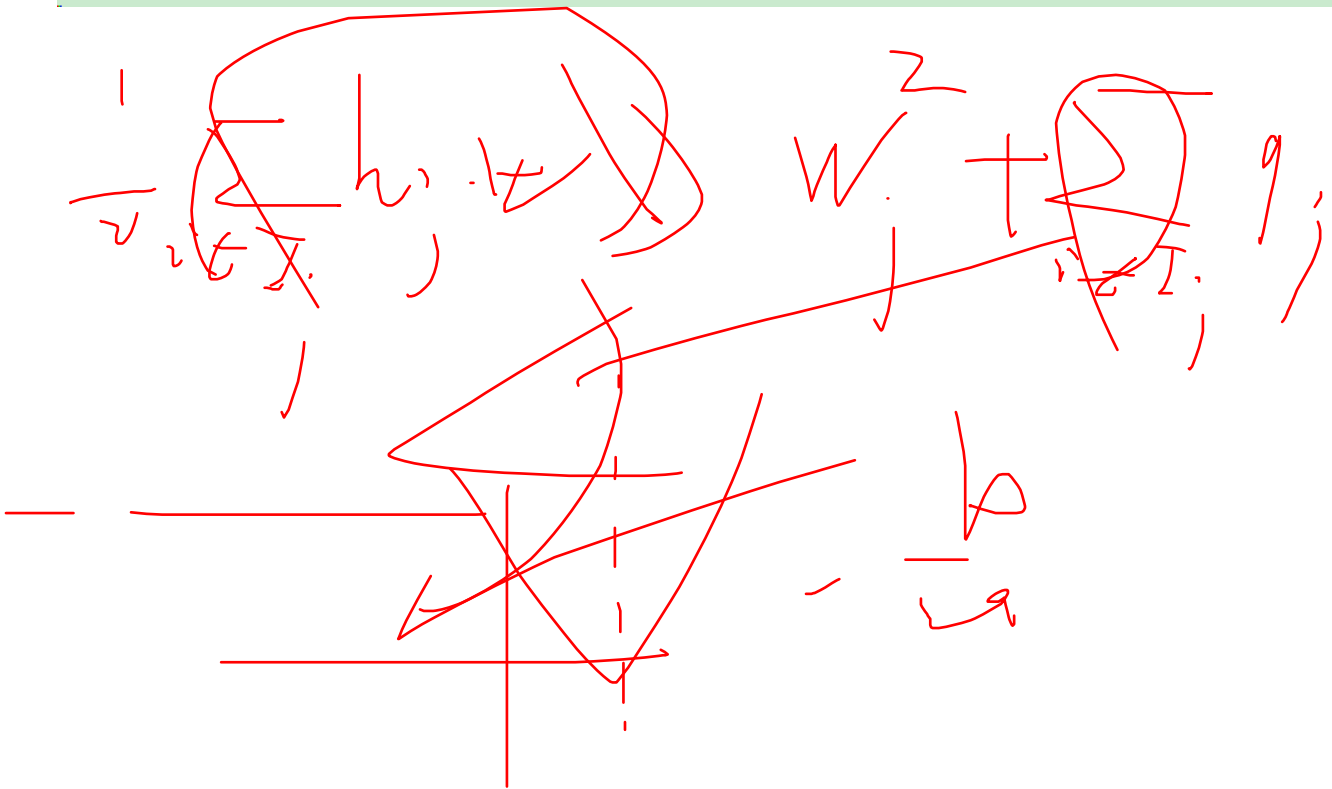
100

|



Q5-678 Huffman

$$= \sum_{j=1}^T [(\sum_{i \in I_j} g_i) w_j + \frac{1}{2} (\sum_{i \in I_j} h_i + \lambda) w_j^2] + \gamma T$$



$$ax^2 + bx + c = 0$$



$$x^2 + \frac{b}{a}x + \frac{c}{a} = 0$$

$$\left(x + \frac{b}{2a}\right)^2 + \dots$$

























































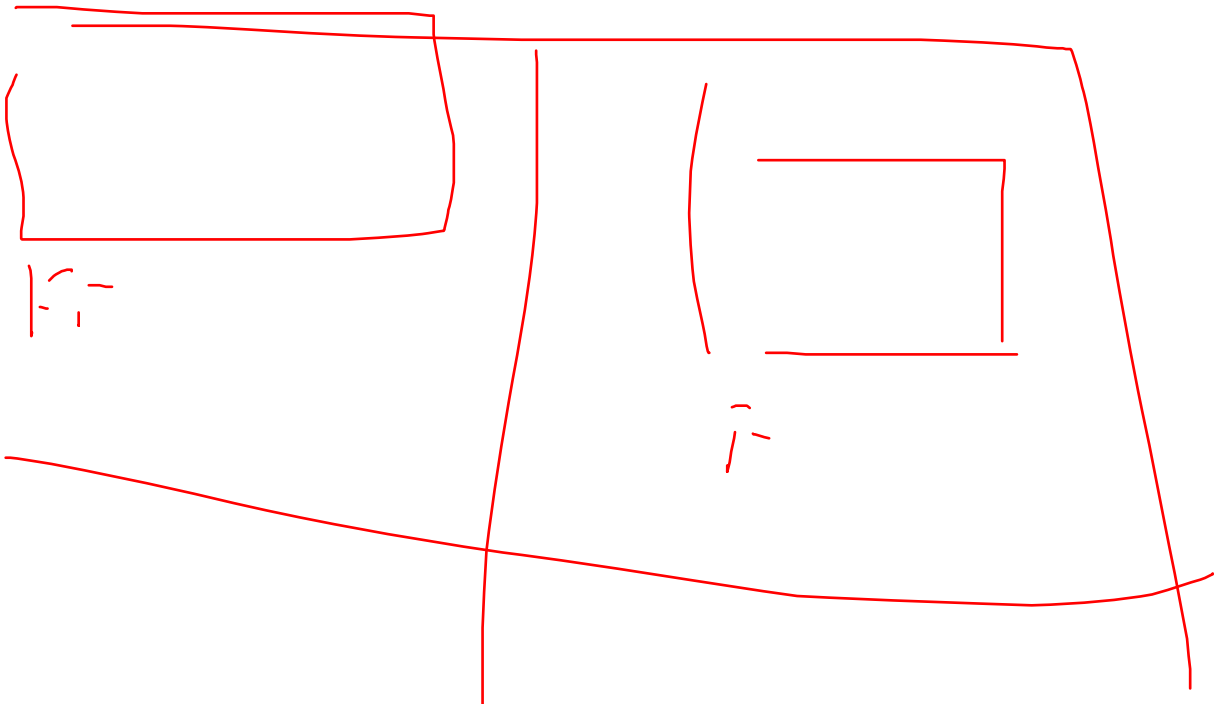
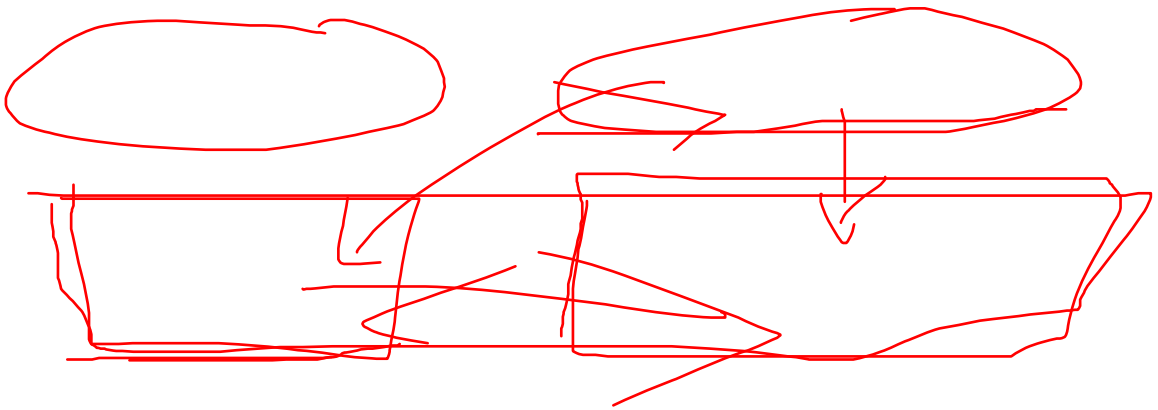




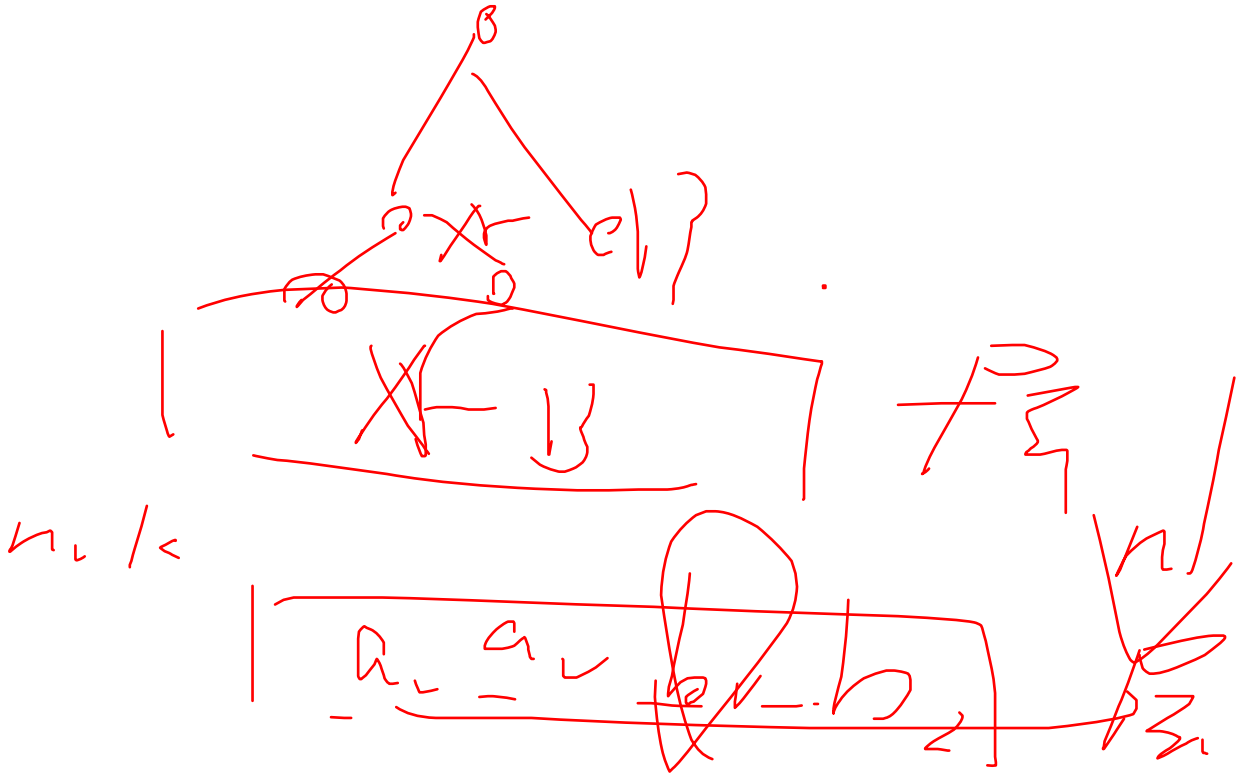














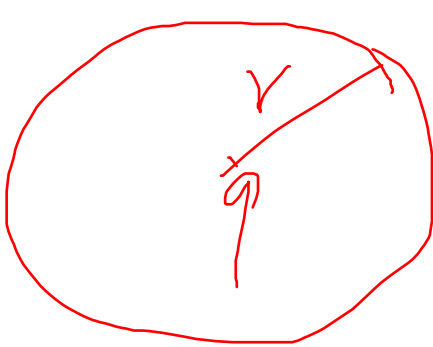












$M$

$\cdot \checkmark$

$$q \sim x + q \sim v \geq q \sim x$$

$$\cancel{\frac{1}{x}} \cdot \checkmark \leq \cancel{M}$$

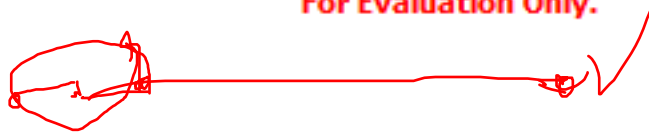
$$(x, q) \leq r$$

$$(q, v) \geq M - r$$

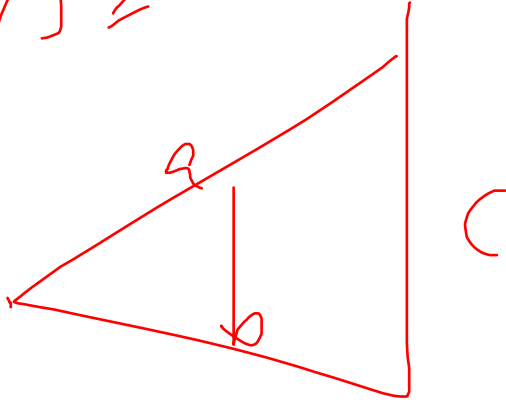
$$(q, x) \leq r$$

$$\Rightarrow (\cancel{x}, v)$$





$$(x, v) \geq$$



$$|a-c| \leq b \leq a+c$$

$$\frac{1}{2} \cdot \left[ \begin{array}{l} (x, 1) \leq v \\ (x, v) \leq M \end{array} \right]$$

$$(q, v) + v \geq M$$































































































