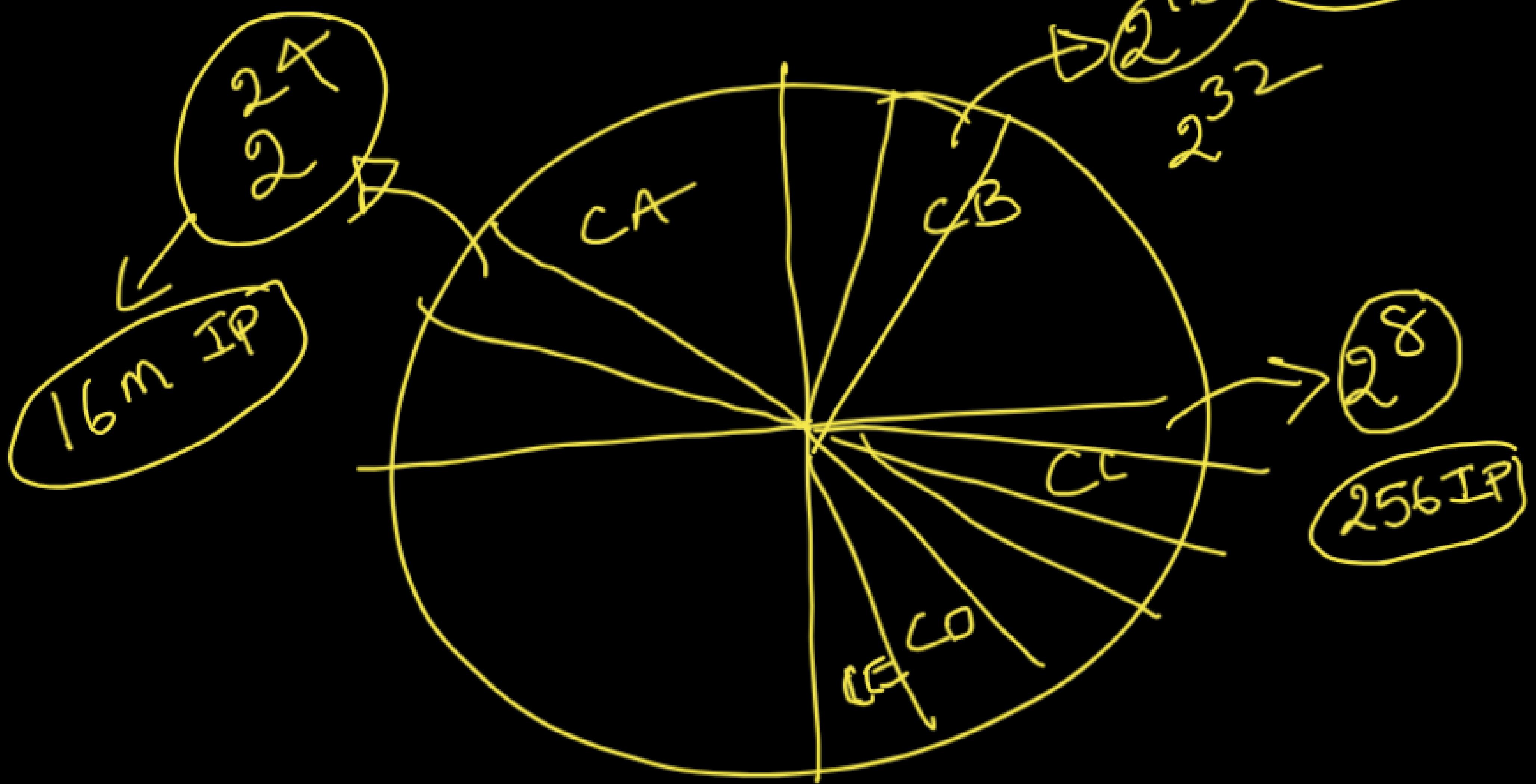
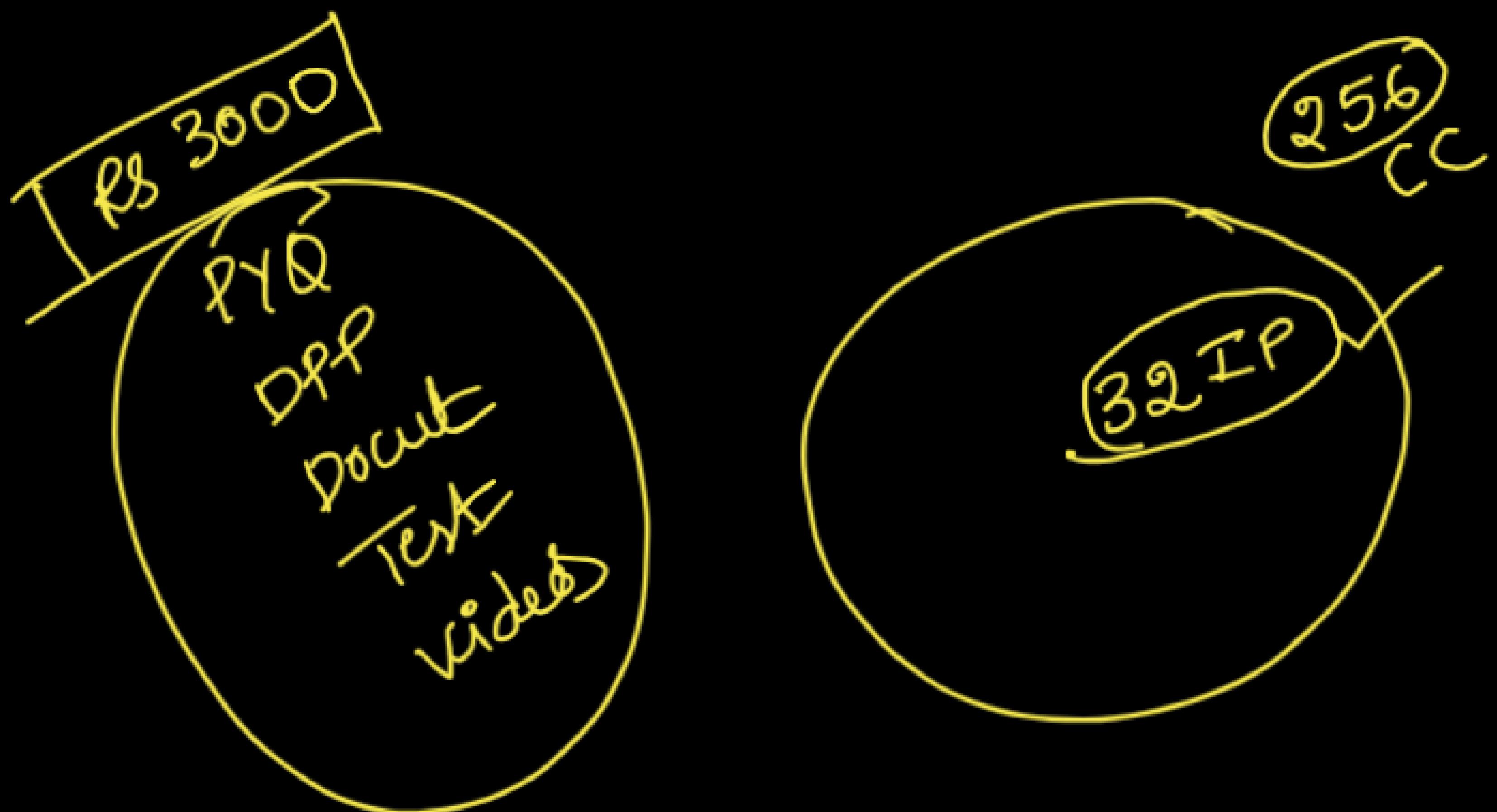
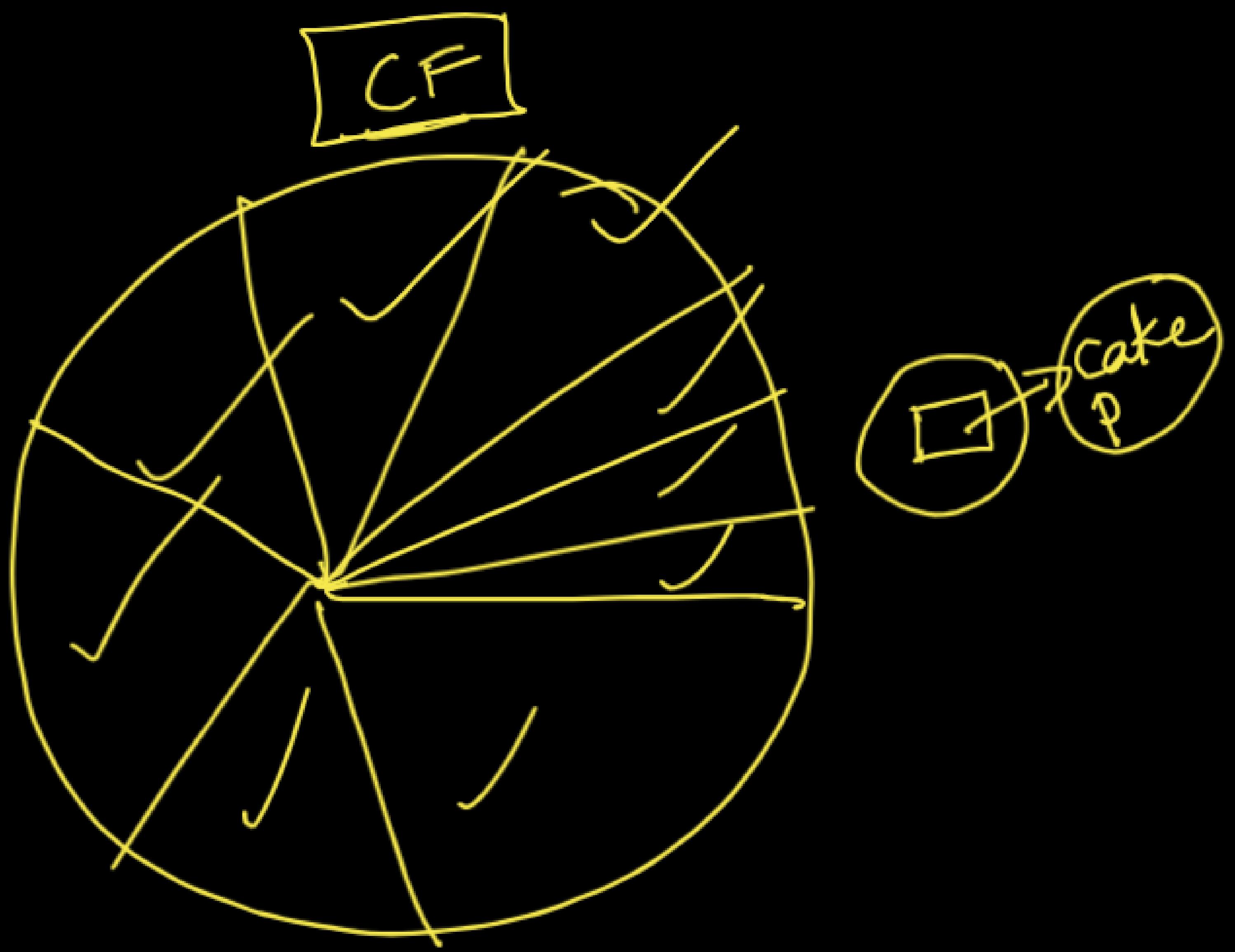


Classful - A, B, C, D, E







CIDR Classless Inter domain Routing

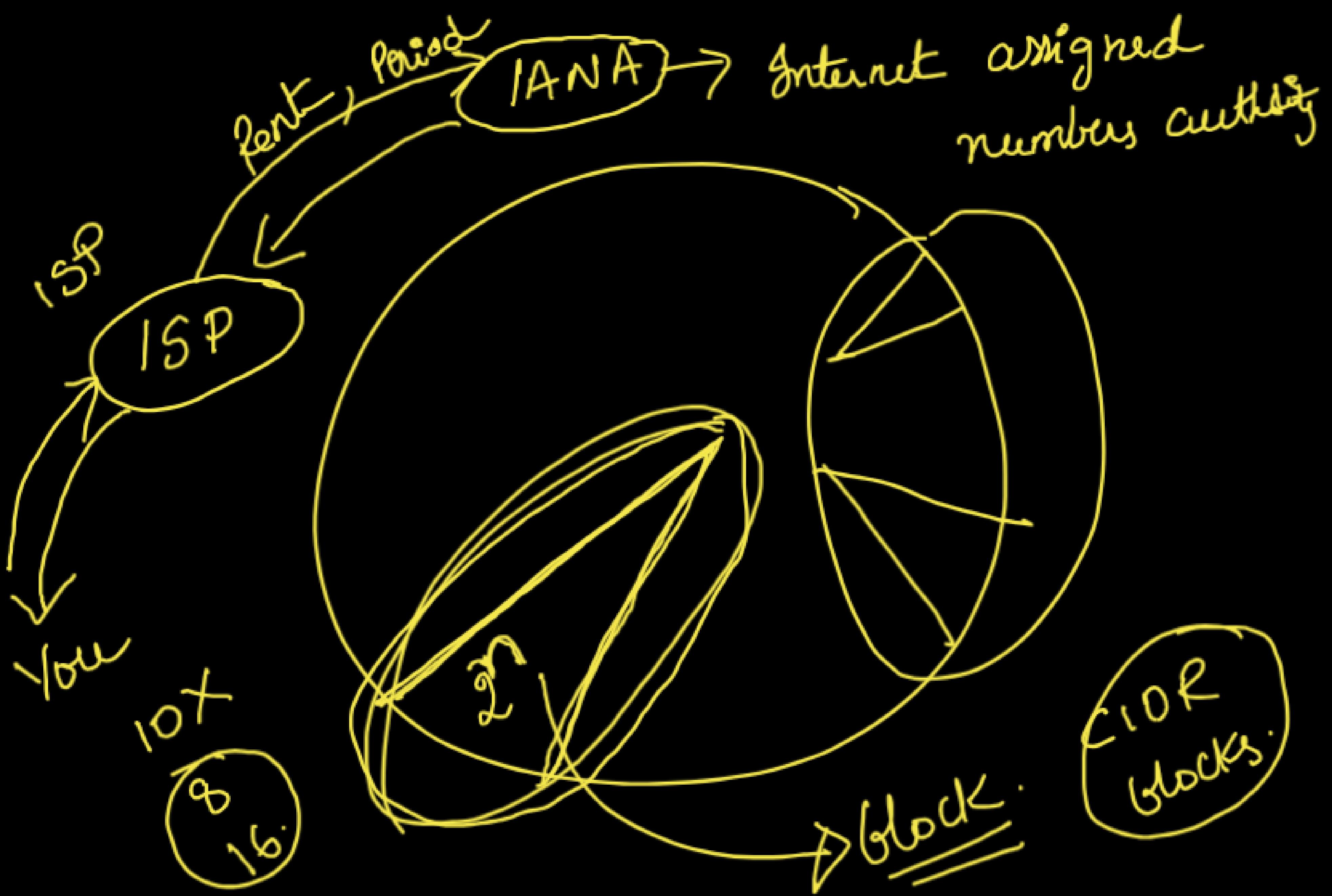
Gate

256

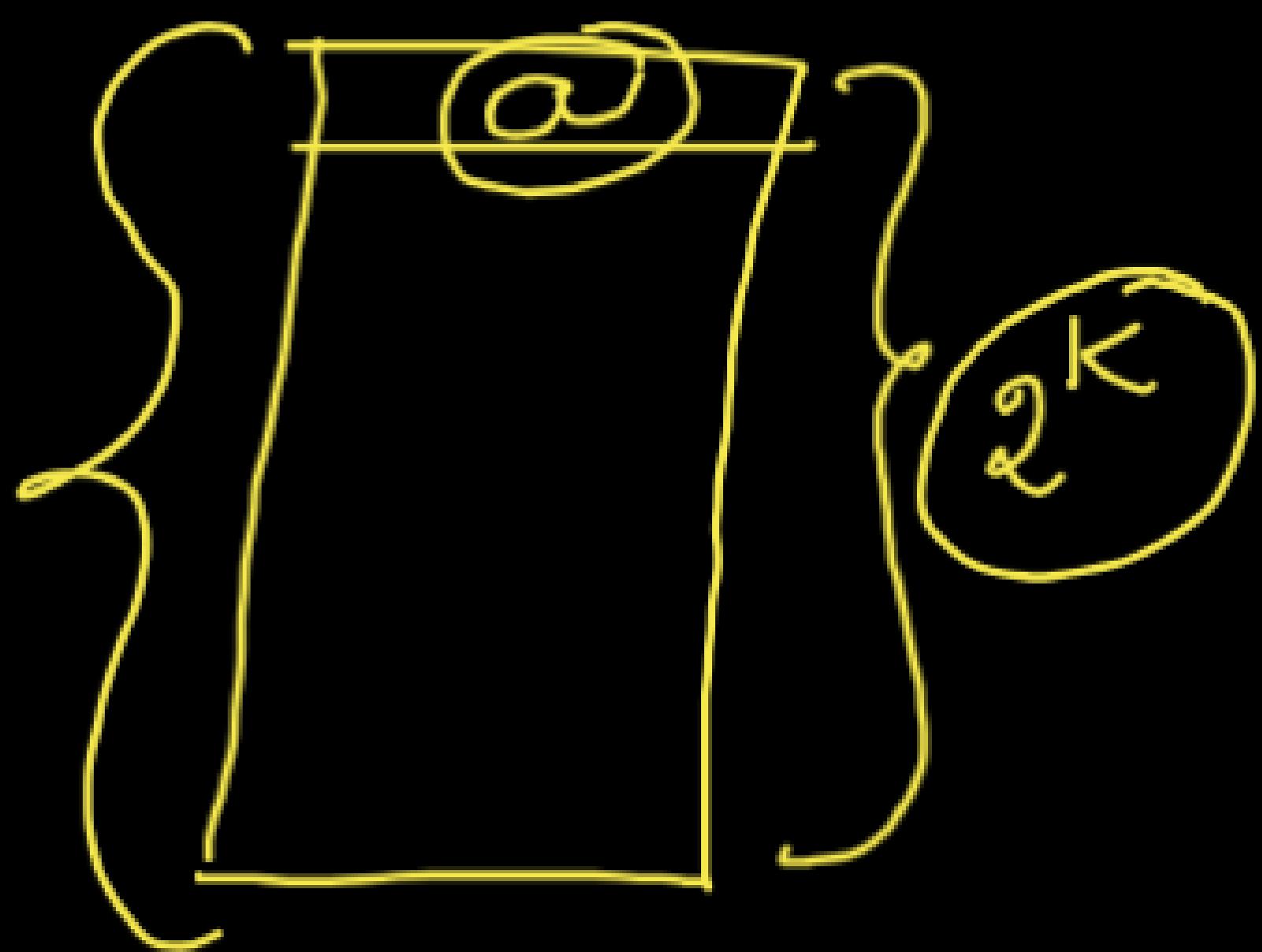
16 IP

1m IP

256



- 1) All IP add should be contiguous ✓
- 2) Size of the block $\rightarrow 2^7$ ✓
- 3) First IP add should be evenly divisible by the size of the block ✓



$$\frac{a}{2^K} = \underline{\underline{\text{rem} \rightarrow 0}}$$

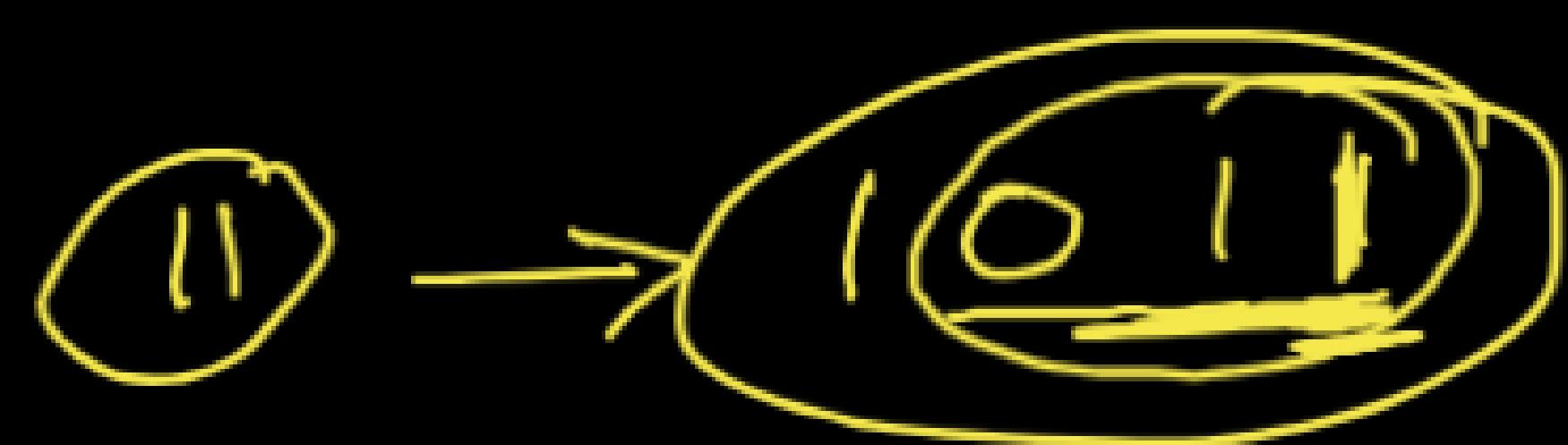
First $\leftarrow 100 \cdot 1 \cdot 2 \cdot 0$ → IP of block
Divisible - ?
Size = 2^8

Binary $\xrightarrow{\cong}$ 32 bit number → Decimal
(Sunday?)

$$\begin{array}{r} 6789 \\ + 9678 \\ \hline 16467 \end{array}$$

↓

256

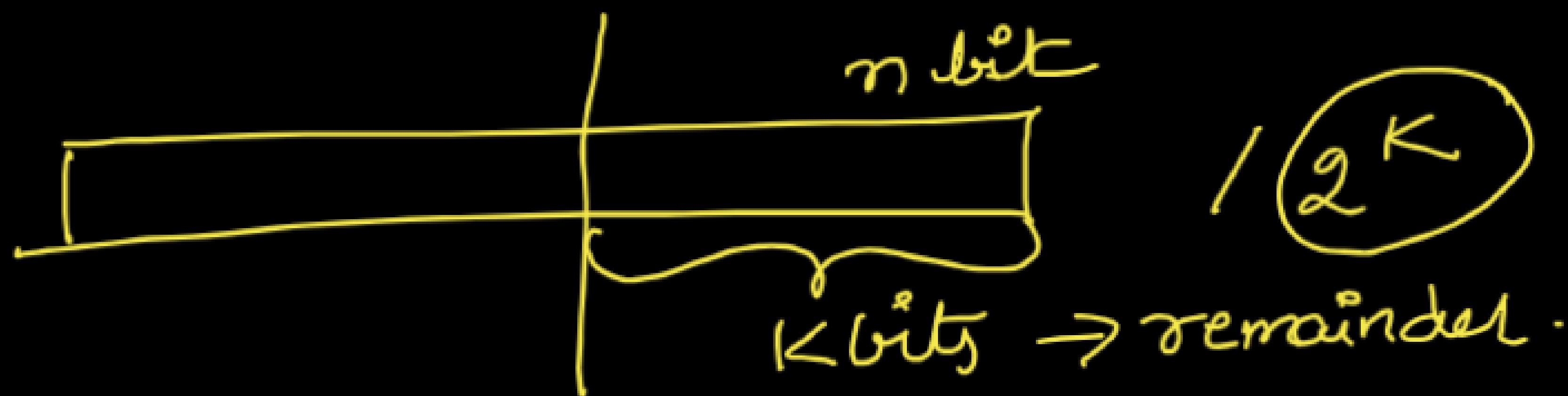


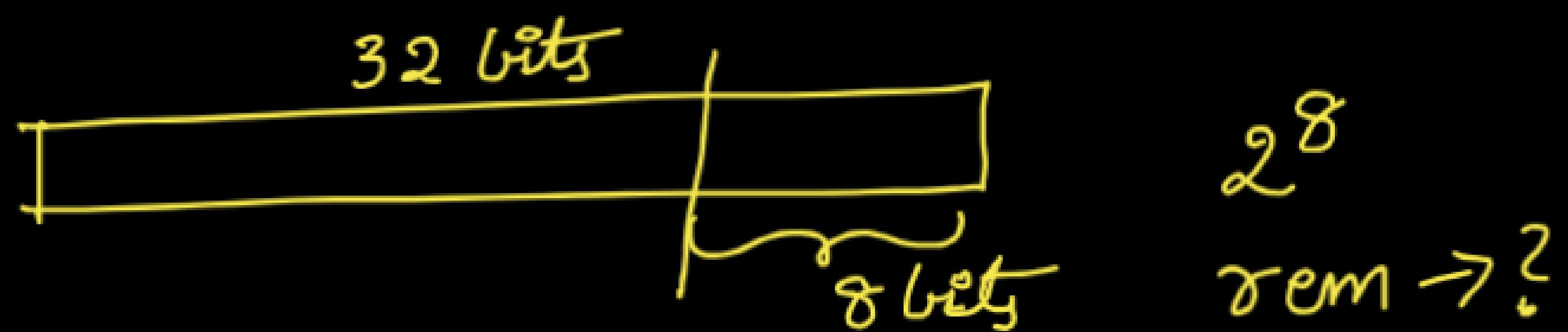
$$11/2^1 \Rightarrow 1$$

$$11/2^2 \Rightarrow 3$$

$$11/2^3 \Rightarrow 2$$

$$11/2^4 \Rightarrow 1$$





10.1.2.32 / (2^8) remainder.

$$10.1.2.0 \quad \boxed{100000} = 32$$

evenly divisible X

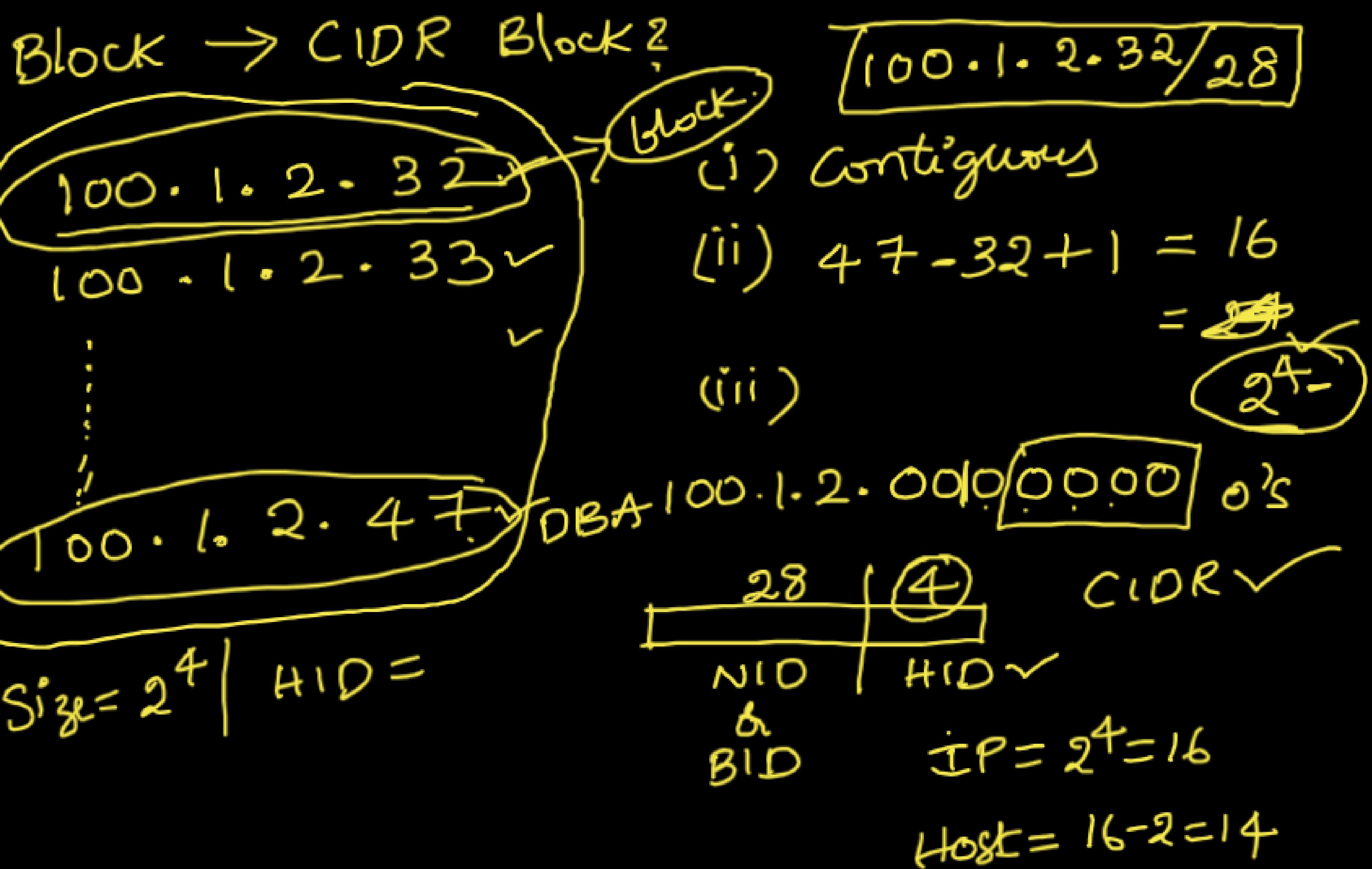
0

$200 \cdot 1 \cdot \underline{2}^8 \cdot \underline{32}^8 \cdot \underline{2^{10}}^?$

$200 \cdot 1 \cdot 00000000$ 106875 25

2^{20} $\cancel{2^9 \times 2^5}$ 544

evenly div & not



100.1.2.32

100.1.2.33

100.1.2.34

⋮

100.1.2.47

$$16 = \underline{2} \quad 4$$

$$47 - 32 + 1 = 16 = \underline{2} \quad 4 \quad < \checkmark$$

10-15

$$100.1.2.32 / \underline{2} \quad 4$$

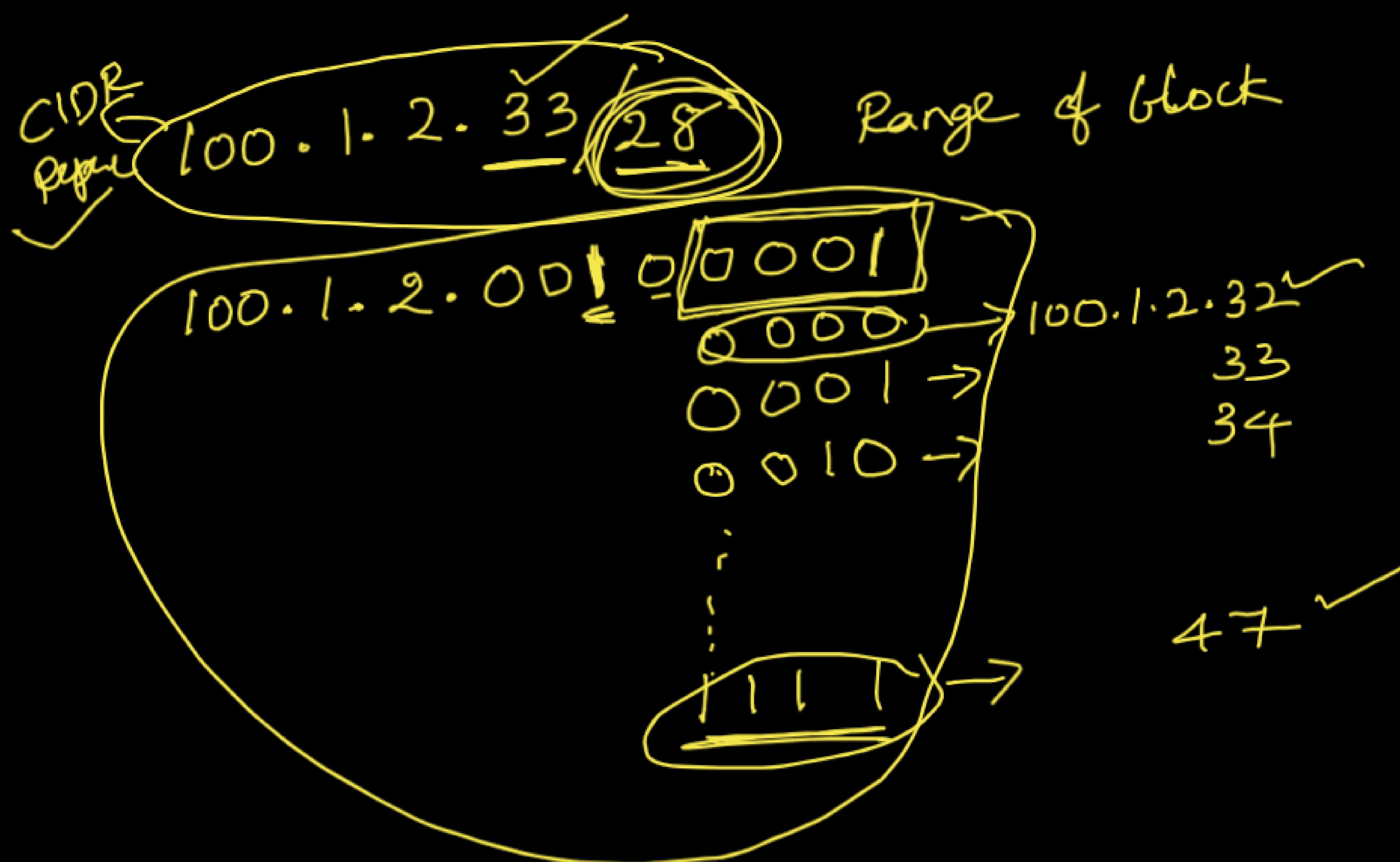
$$100.1.2.0010 \boxed{0000} \text{ sum} = 0 \quad \checkmark$$

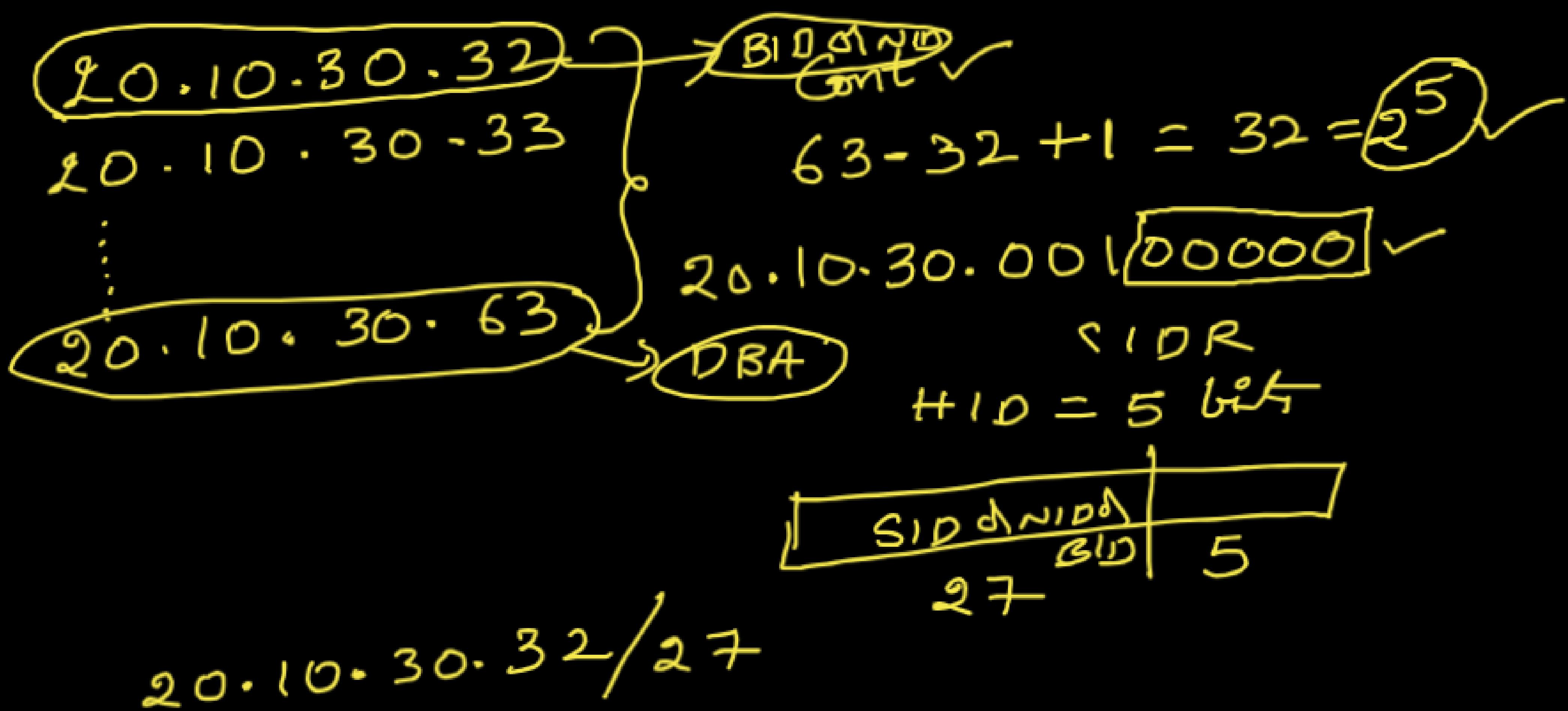


32

100.1.2.32 / 28

125 120 129 124





{ $\underbrace{150 \cdot 10 \cdot 20 \cdot 64}_{\vdots}$ } \rightarrow BID Conti ✓
 $150 \cdot 10 \cdot 20 \cdot 65$ NID
 \vdots SID Size $127 - 64 + 1$
 $\underbrace{150 \cdot 10 \cdot 20 \cdot 127}_{\vdots}$ } \rightarrow DBA
 $150 \cdot 10 \cdot 20 \cdot 01 \boxed{000000}$ DIV ✓

$$2^6 \quad \text{HID} = 6 \text{ bits}$$

$$\text{NID} = 26 \text{ bits}$$

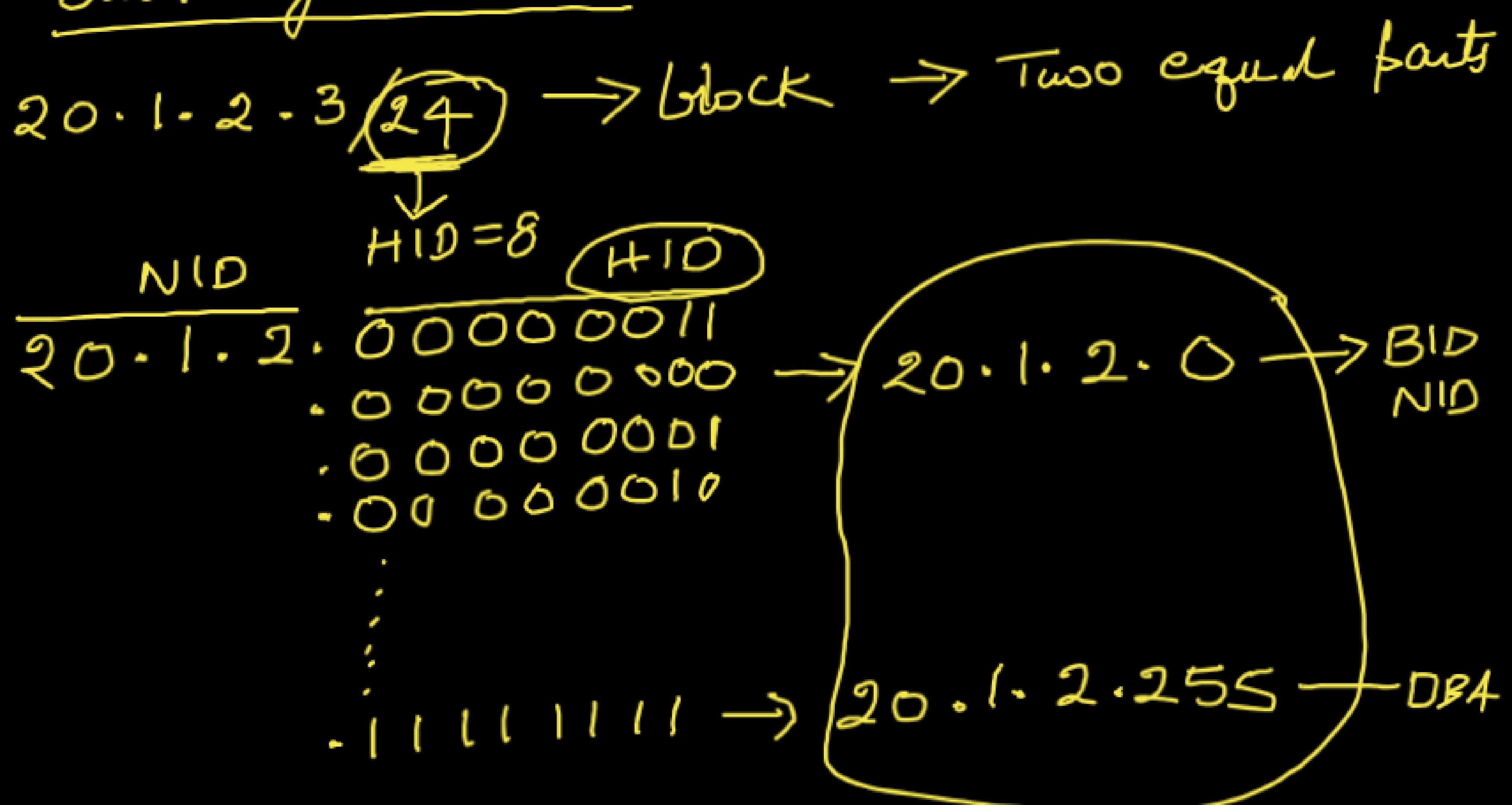
CIDR $\boxed{150 \cdot 10 \cdot 20 \cdot 64 / 26}$

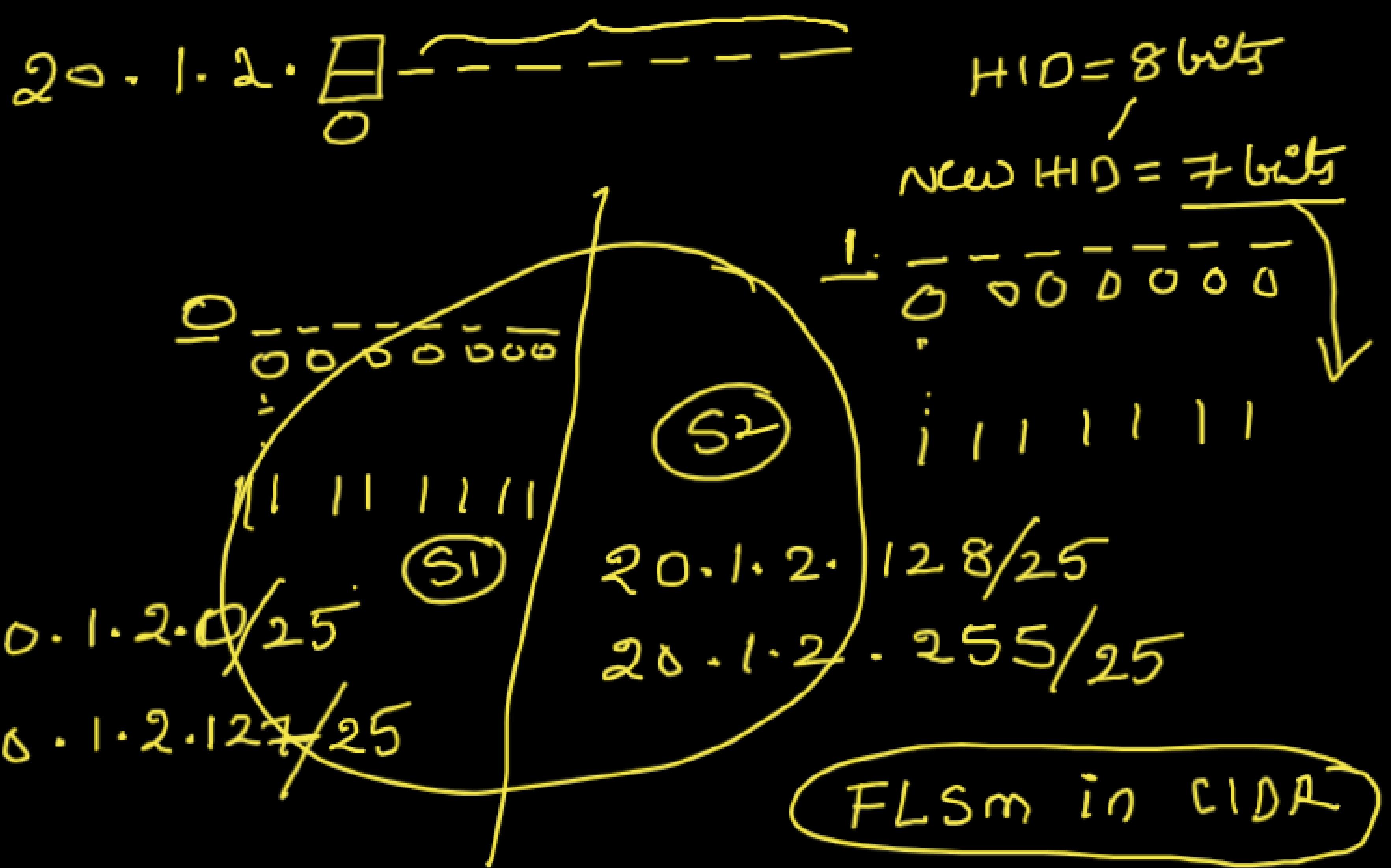
$150 \cdot 10 \cdot 20 \cdot \underbrace{127}_{26} / \boxed{26}$ $6 \Leftrightarrow 0's$
 $1's$

100.1.2.20
100.1.2.21
100.1.2.22
⋮
⋮
100.1.2.30

cont ✓
 $\text{size} = 30 - 20 + 1$
 $= 11 \neq 2^k \times$
X LOR

Subnetting in CIDR





H1D = 7 bits
 N1D ⋄ S1D & B1D = 25 ($32 - 7$)

$20 \cdot 30 \cdot 40 \cdot 10 / 25$ → equal sized subnets

$$NID = 25 + 10 = 32 - 25 = 7$$

$20 \cdot 30 \cdot 40 \cdot 0$ 

⋮
1 1 1 1 1 1 1 - 111

NID

$20 \cdot 30 \cdot 40 \cdot 0$

Block

$20 \cdot 30 \cdot 40 \cdot 127$

DBA

A hand-drawn diagram of a celestial sphere centered on the North Celestial Pole (NCP). The sphere is divided into two hemispheres by a vertical line passing through the NCP. The left hemisphere contains the following markings:

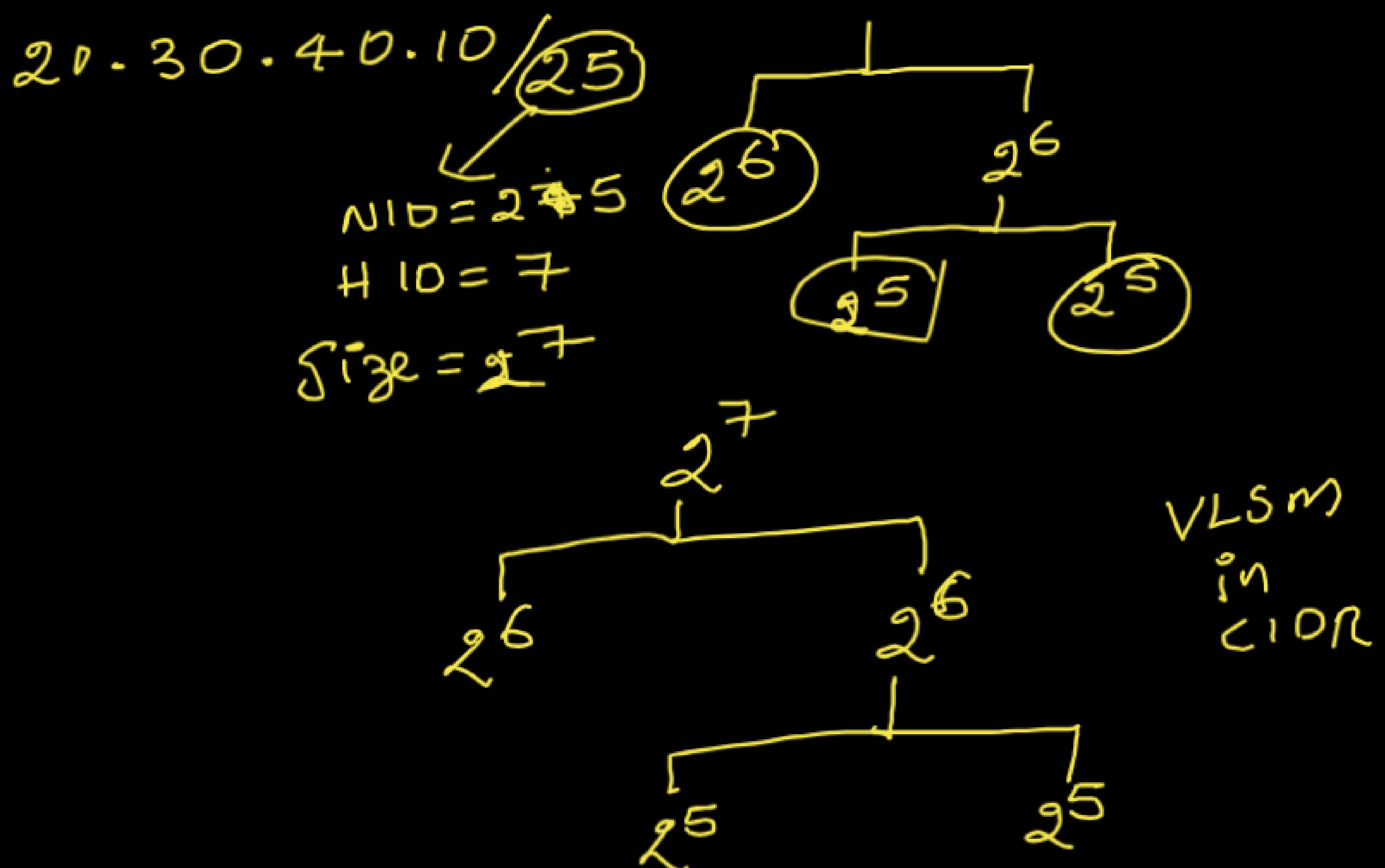
- At the top left, there is a circle containing the numbers "25 X" and "6 X 10".
- Below these circles is a horizontal line with the numbers "0 0 0 0 0 0" written under it.
- To the right of the horizontal line is a vertical line labeled "01" at the top and "0 0 0 0 0" at the bottom.
- On the left side of the sphere, there is a vertical line with five short tick marks above it, labeled "1 1 1 1 1".
- At the bottom left, there is a circle containing the numbers "20 30 40 0/26" and "to 20 30 40 63/25".
- At the very bottom left, there is another circle containing the numbers "20 30 40 0/26".

The right hemisphere contains the following markings:

- At the top right, there is a circle containing the numbers "20 30 40 0/26" and "20 30 40 127/26".
- Below these circles is a vertical line labeled "0 0 0 0 0" at the top and "1 1 1 1 1" at the bottom.
- On the right side of the sphere, there is a vertical line with five short tick marks above it, labeled "1 1 1 1 1".
- At the top right, there is a circle containing the numbers "20 30 40 0/26" and "0 0 0 0 0".

At the very top center of the sphere, there is a circle containing the numbers "20 30 40 0/26" and "0 0 0 0 0".

Other labels visible include "N10" near the top center, "0 64" near the top right, and a dashed line extending from the top center towards the top right.

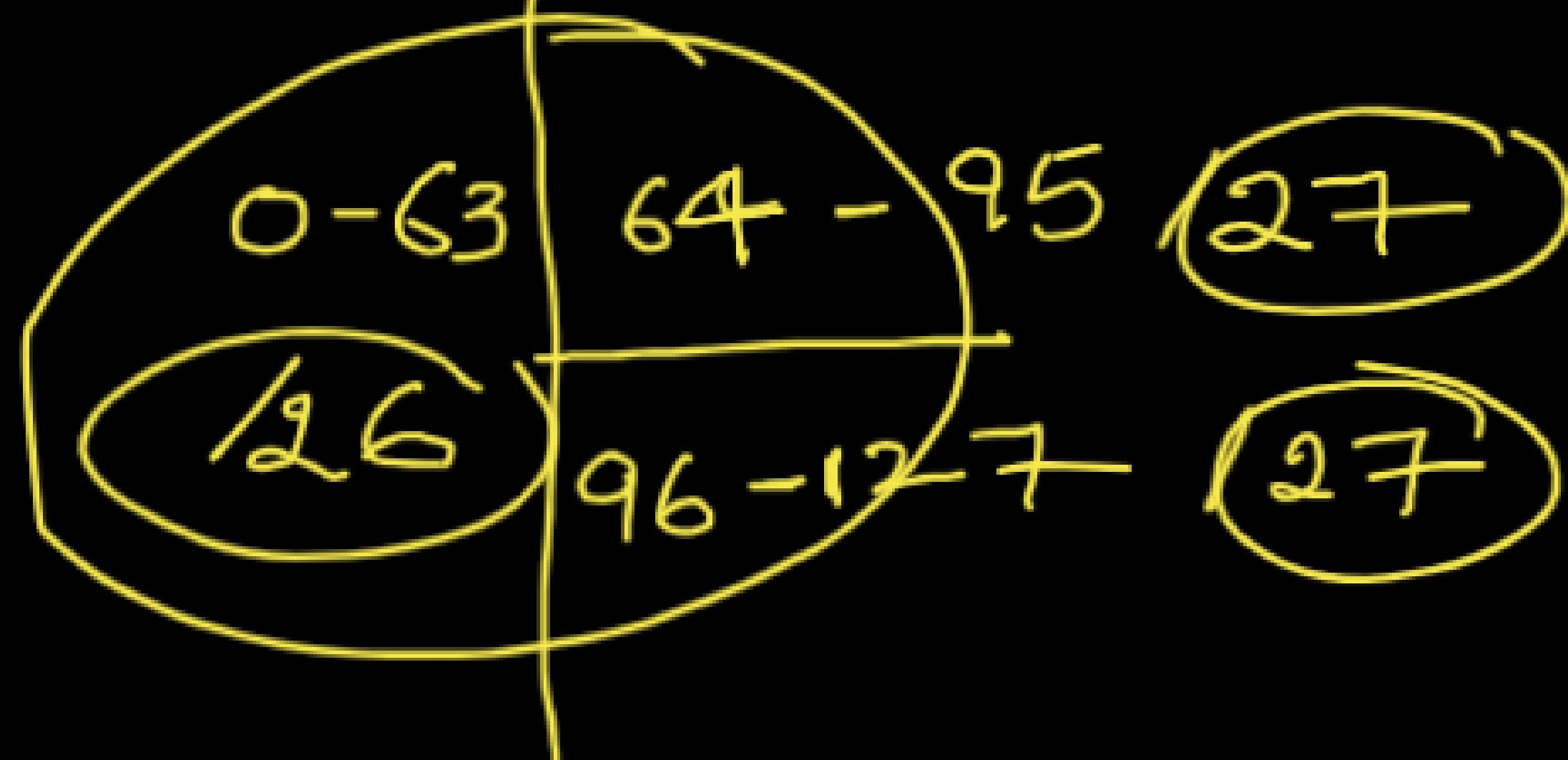


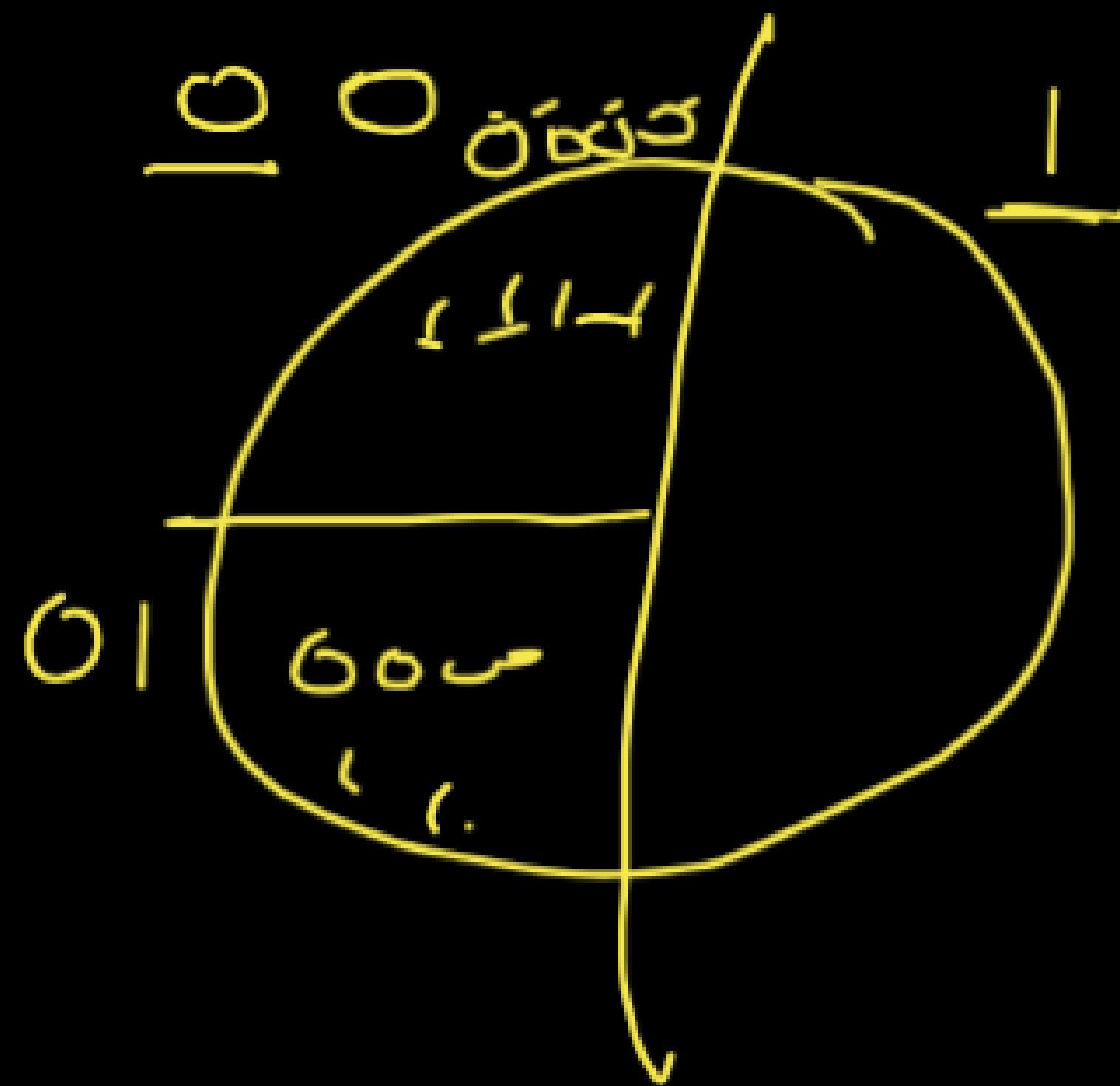
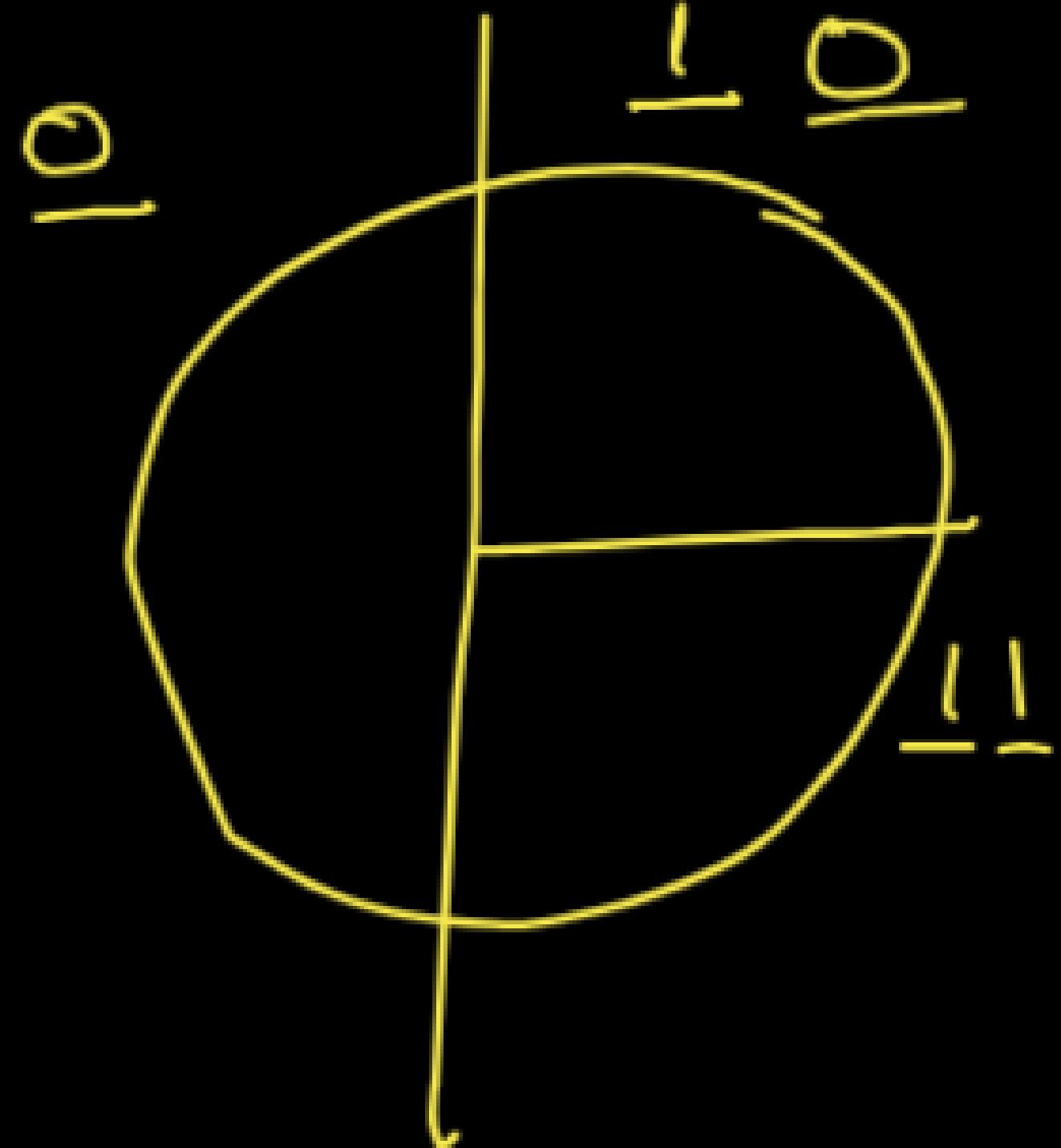
$$20 \cdot 30 \cdot 40 \cdot 10 / \underline{\underline{25}}$$

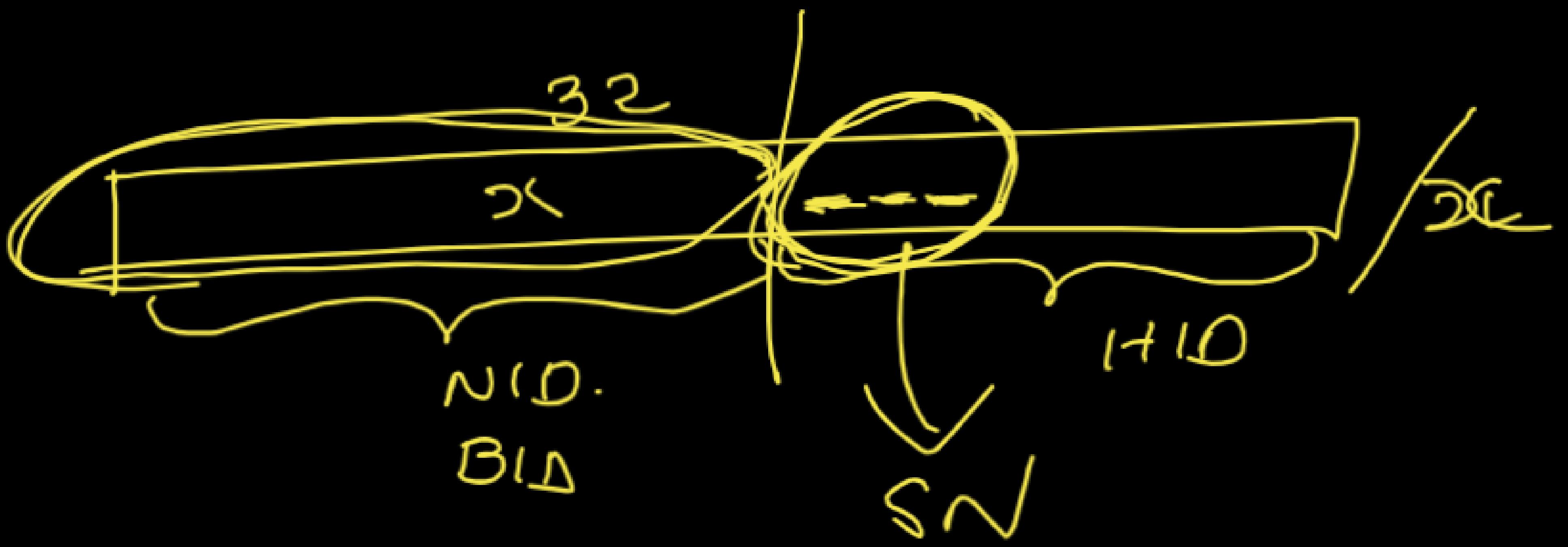
$$\begin{array}{r} 20 \cdot 30 \cdot 40 \cdot 10 \\ \hline 20 \cdot 30 \cdot 40 \cdot 10 \\ \text{NID} \end{array}$$

$\begin{array}{r} 64 - 32 - - - - \\ \checkmark \boxed{0} - 25+1 \\ \checkmark \boxed{10} \quad 25+2 \\ \checkmark \boxed{11} \quad 25+2 \end{array}$

20



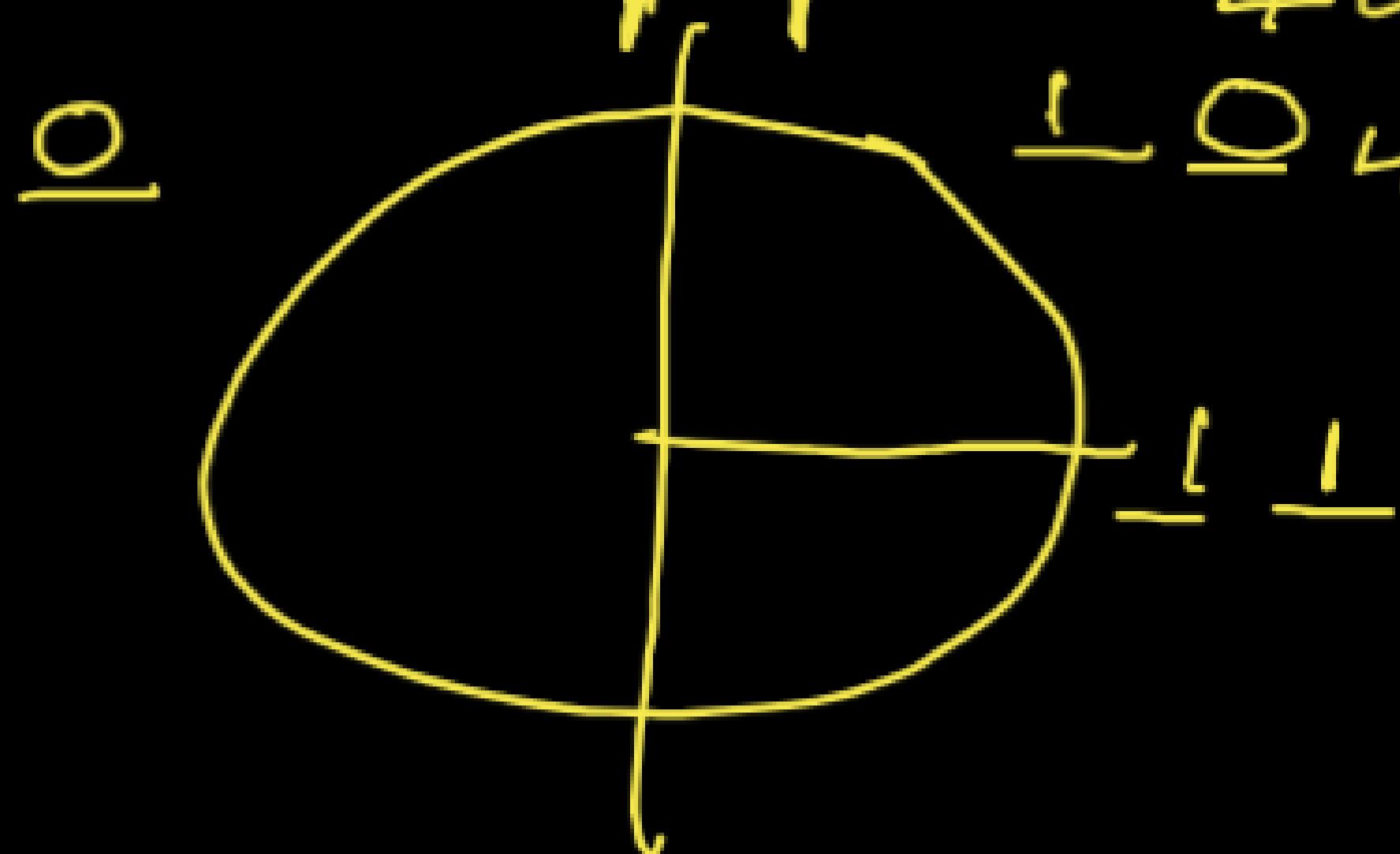


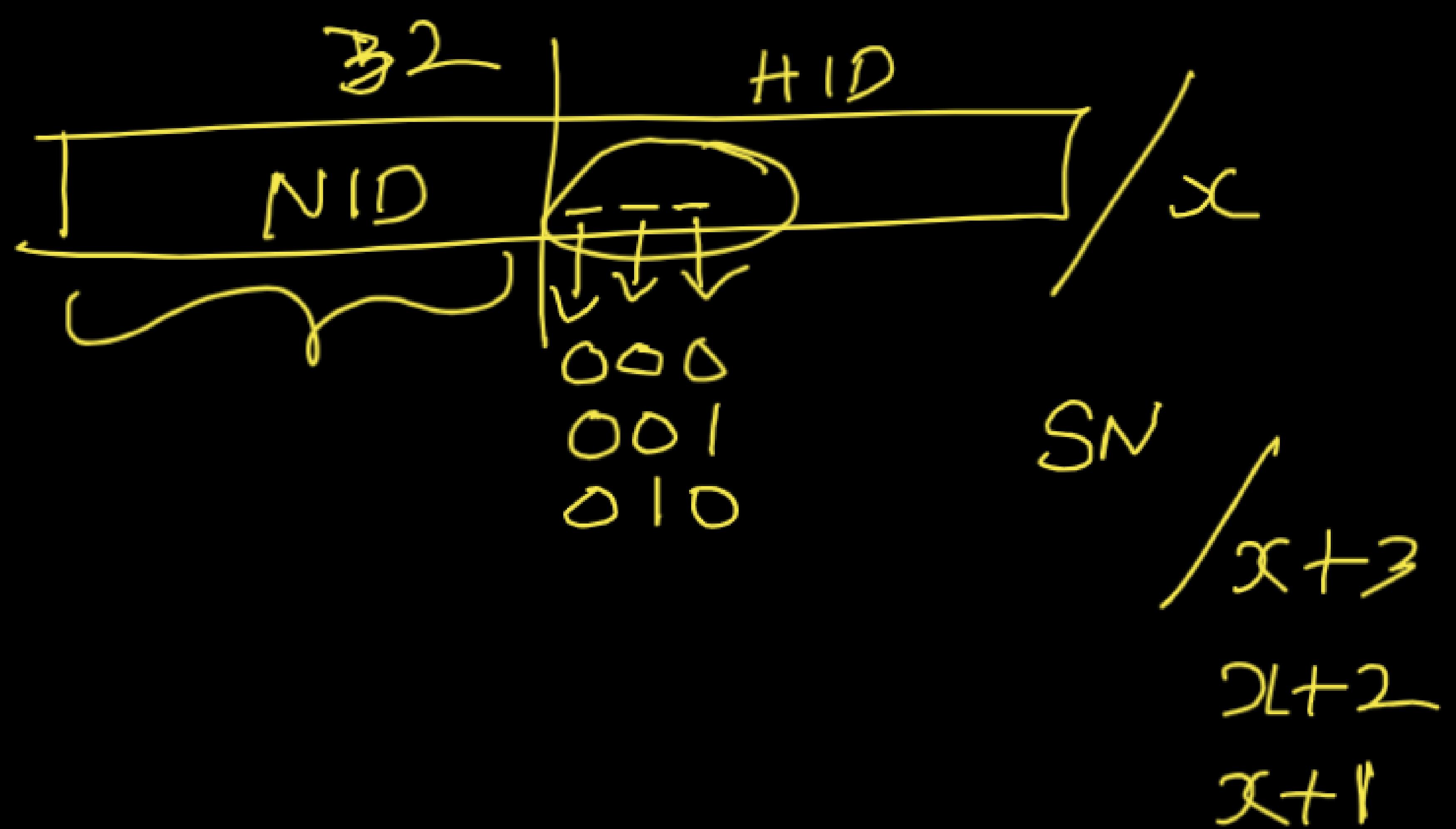


$$\frac{40}{8} \cdot \frac{30}{8} \cdot \frac{10}{4} \cdot 10 / \underline{\underline{20}}$$

$$2^{11} \quad 2^{11}$$

$$\begin{array}{r} 40 \cdot 30 \cdot 0000 \\ \hline 40 \cdot 30 \cdot 0000 \\ \text{NID 6B10} \end{array} \quad \begin{array}{r} 1010 \cdot 000010102^{10} \\ 2^3 2^2 - - - - - \\ \textcircled{1} 0 \\ 1 \end{array} \quad \begin{array}{r} 2^{10} \\ 40 \cdot 30 \cdot 0 \cdot 0 / 21 \\ 40 \cdot 30 \cdot 8 \cdot 0 / 22 \\ \perp \quad 40 \cdot 30 \cdot 12 \cdot 0 / 22 \end{array}$$





$$10 \cdot 10 \cdot 10 \cdot 10 / 12$$

↑
Division

↓
NID

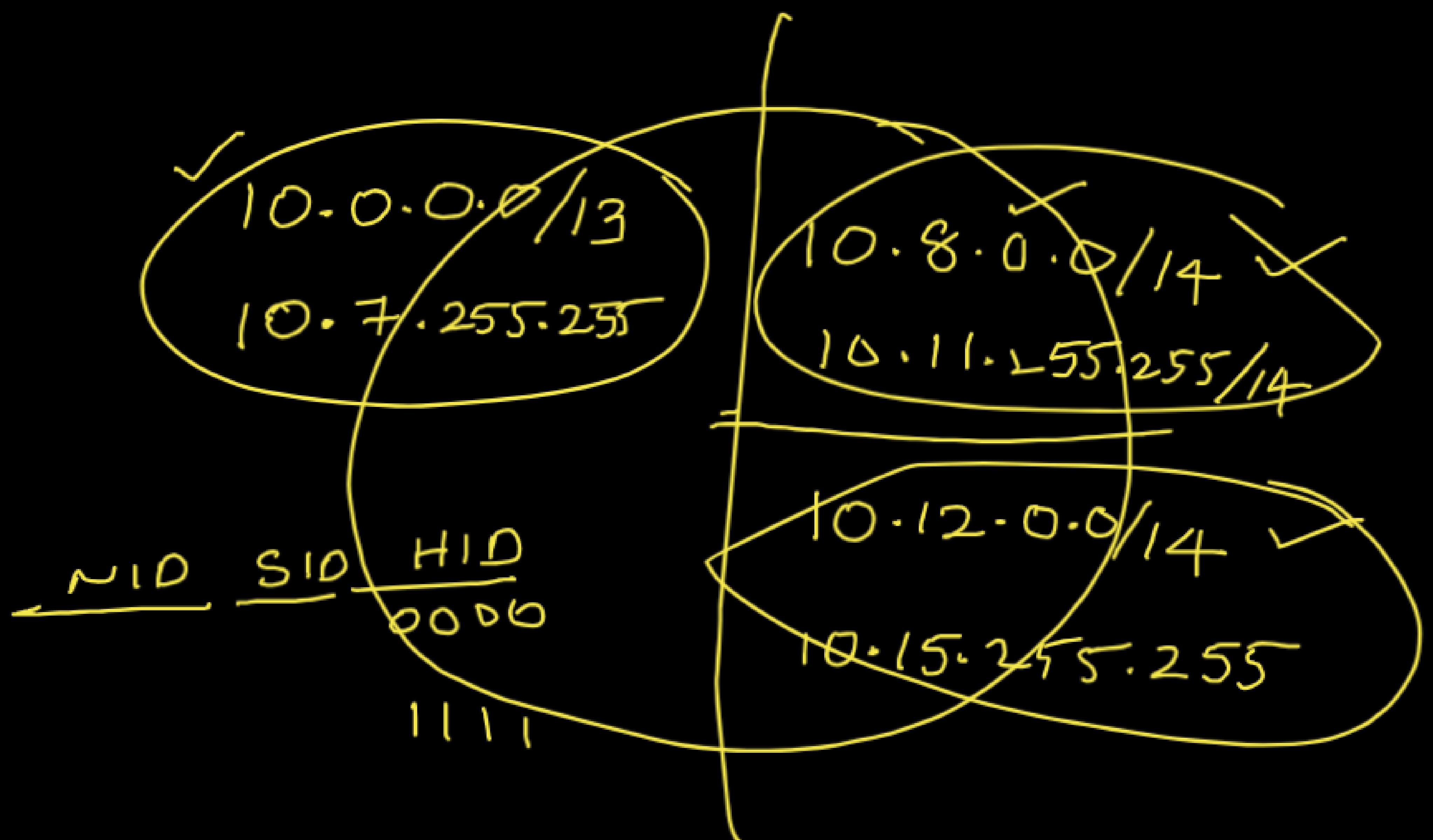
$\frac{1}{12} \quad \frac{1}{4} \quad \frac{1}{4}$

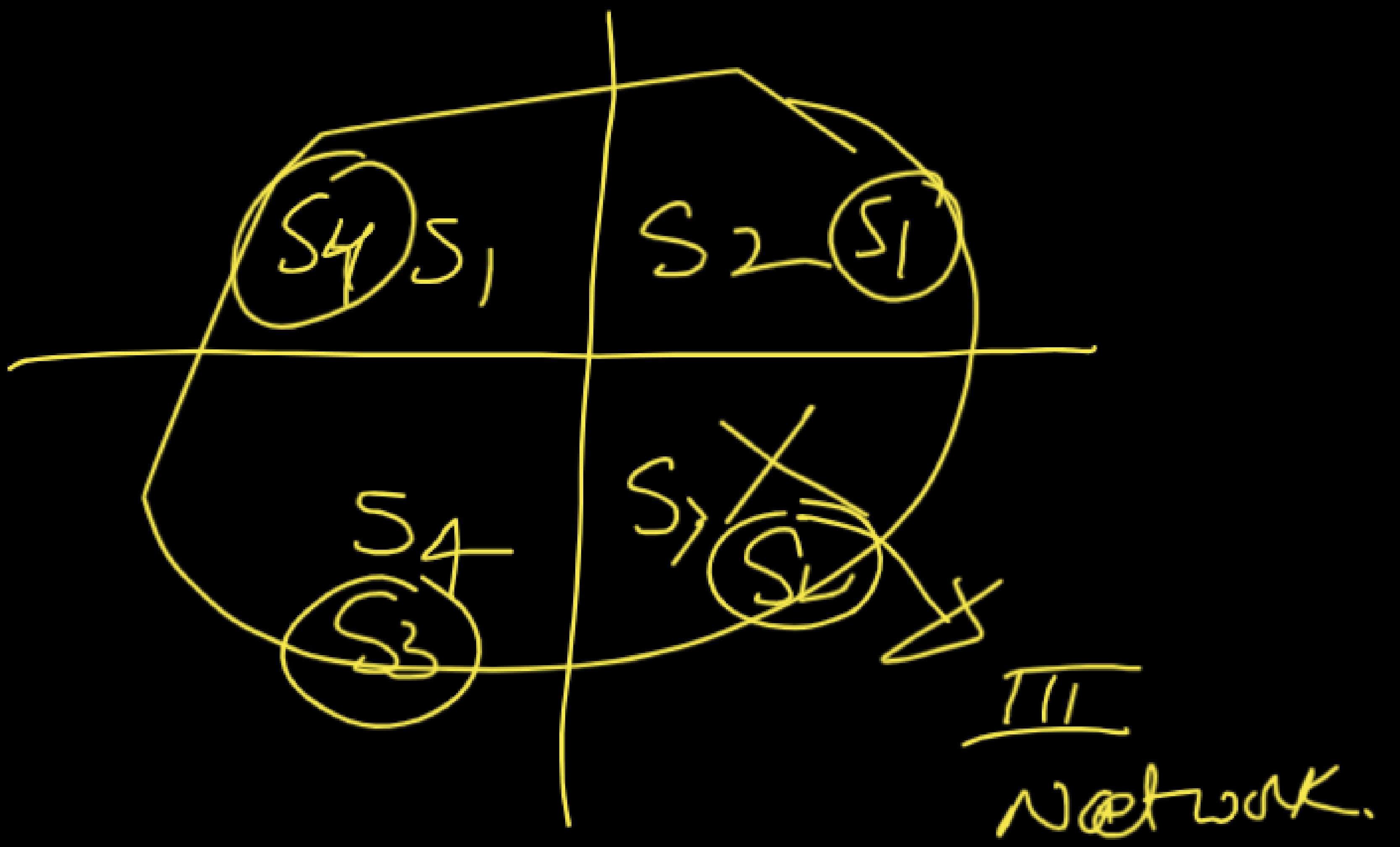
$$\begin{array}{r} \overline{NID} \\ - 10 \cdot 00000 | 1010 \cdot 0000 | 1010 \cdot 0000 | 1010 \end{array}$$

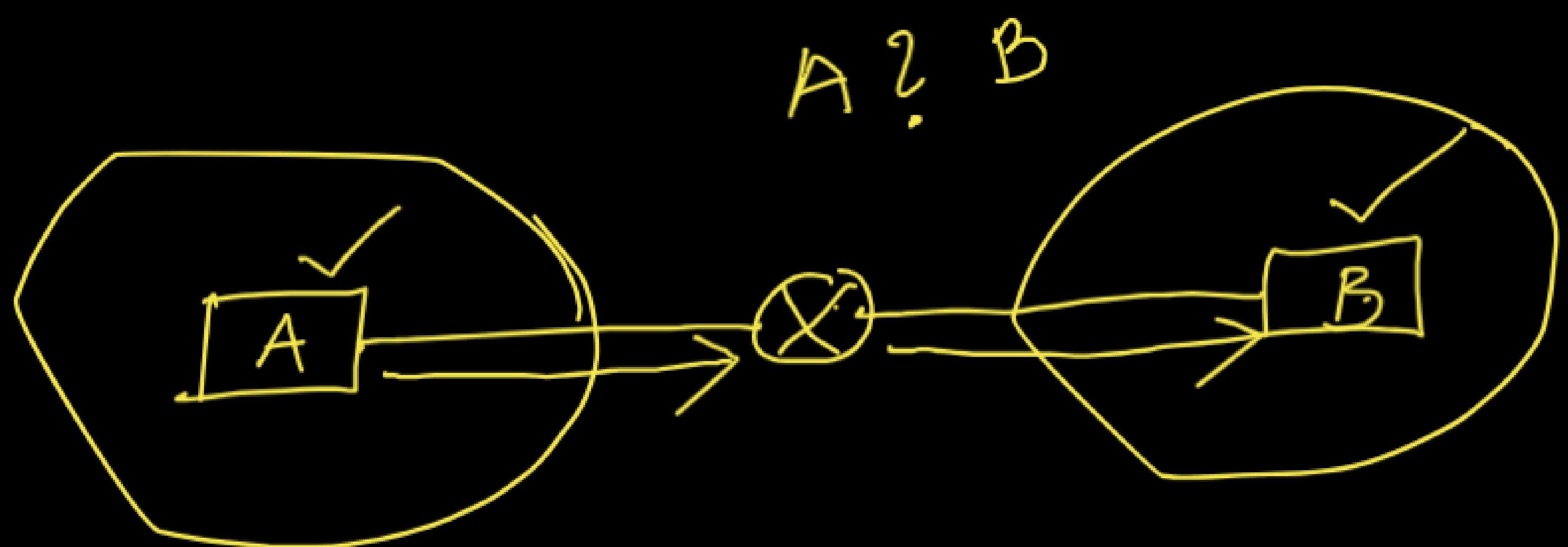
$$\begin{array}{r} 84-- \\ \underline{-0} \quad -10 \cdot 0 \cdot 0 \cdot 0 / 13 \\ 10 \quad -10 \cdot 8 \cdot 0 \cdot 0 / 14 \\ 00 \quad -10 \cdot 12 \cdot 0 \cdot 0 / 14 \\ 01 \end{array}$$

DBA
 $HID-1's$

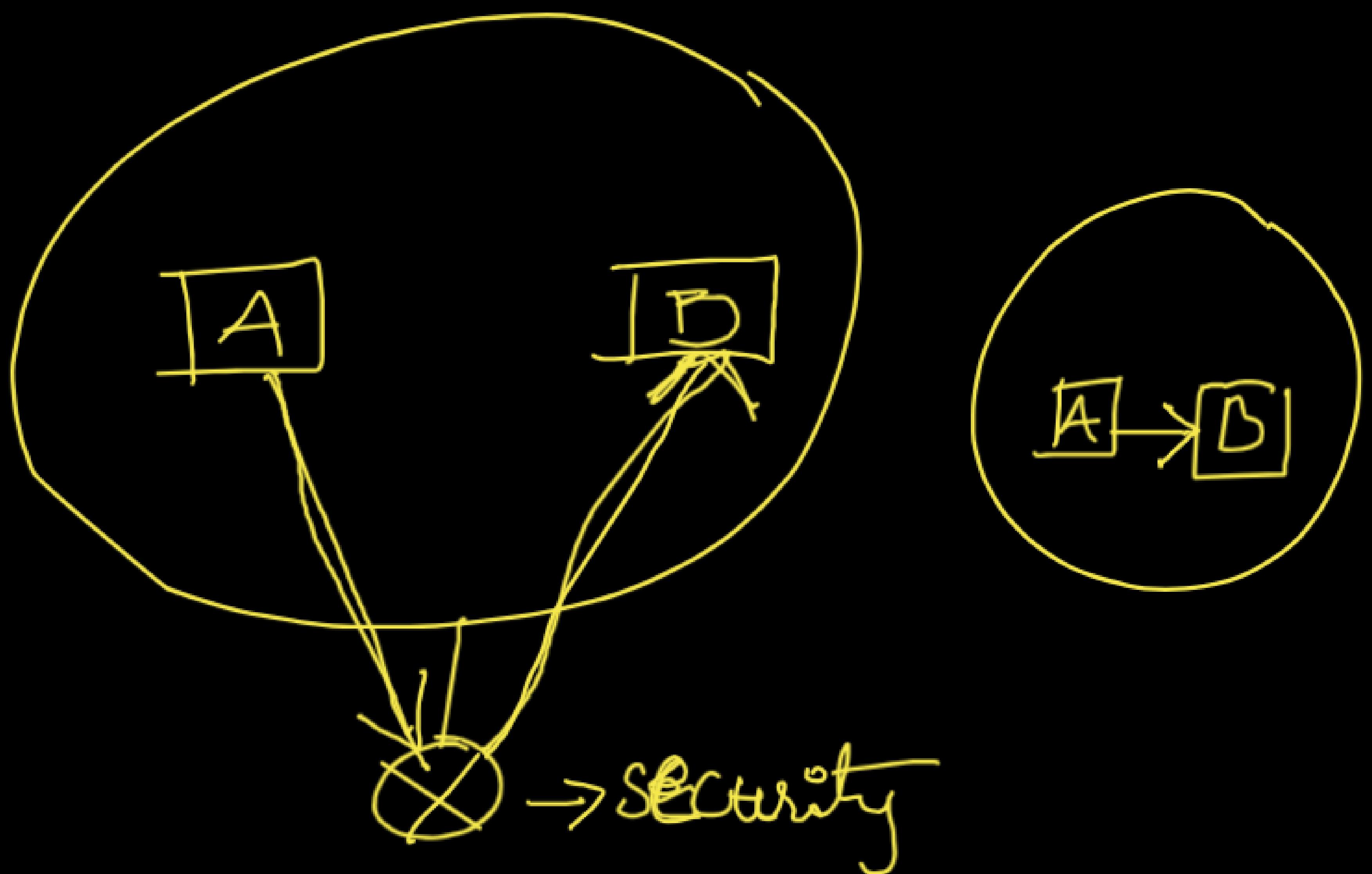
$$\boxed{\begin{array}{l} 10 \cdot 0 \cdot 0 \cdot 0 / 14 \quad 10 \cdot 8 \cdot 0 \cdot 0 / 13 \\ 10 \cdot 4 \cdot 0 \cdot 0 / 14 \end{array}}$$







Subnet mask → illusion



$$\frac{\text{Host A: } IP_A}{SMA}$$

At A

$$\frac{I_A}{SMA} \quad \frac{SMA}{NIDAA}$$

$$\otimes \quad \frac{At A:}{IP_B} \quad \frac{SMA}{NIDBA}$$

$$\frac{\text{Host B: } IP_B}{SMB}$$

At A: IP_A

SMB

At B:

$$\frac{I_B}{SMB} \quad \frac{SMB}{NIDBB}$$

$$\otimes \quad \frac{At B:}{IP_A} \quad \frac{SMB}{NIDAB}$$

$$A: I_A: 200 \cdot 1 \cdot 2 \cdot 10$$

$$S_A: \underline{255} \cdot \underline{255} \cdot \underline{255} \cdot \underline{128}$$

$$B: I_B: 200 \cdot 1 \cdot 2 \cdot 130$$

$$\begin{array}{r} 100000000 \\ 10000010 \\ \hline 100000000 \end{array}$$

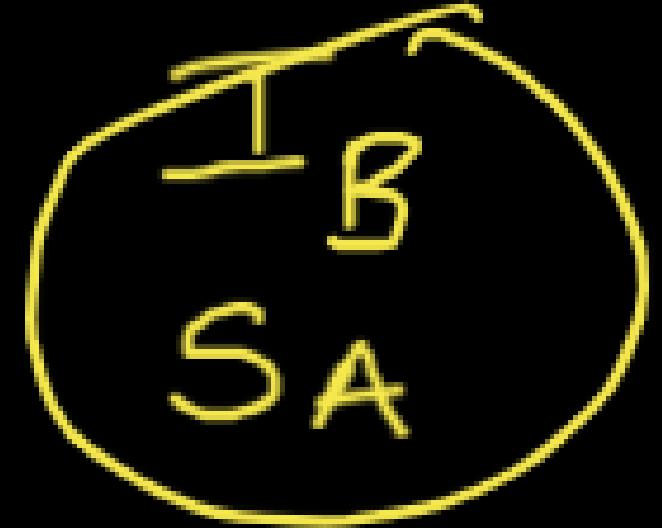
acc to A 

$$I_A: 200 \cdot 1 \cdot 2 \cdot 00001010$$

$$S_A: 255 \cdot 255 \cdot 255 \cdot 100000000$$

$$200 \cdot 1 \cdot 2 \cdot 0 = NID_{AA}$$

$$200 \cdot 1 \cdot 2 \cdot 128 = NID_{BA}$$

 I_B
 S_A

$I_A : 200.1.2.10$

$S_A : 255.255.255.128$

$I_B : 200.1.2.69$

$S_B : 255.255.255.192$

