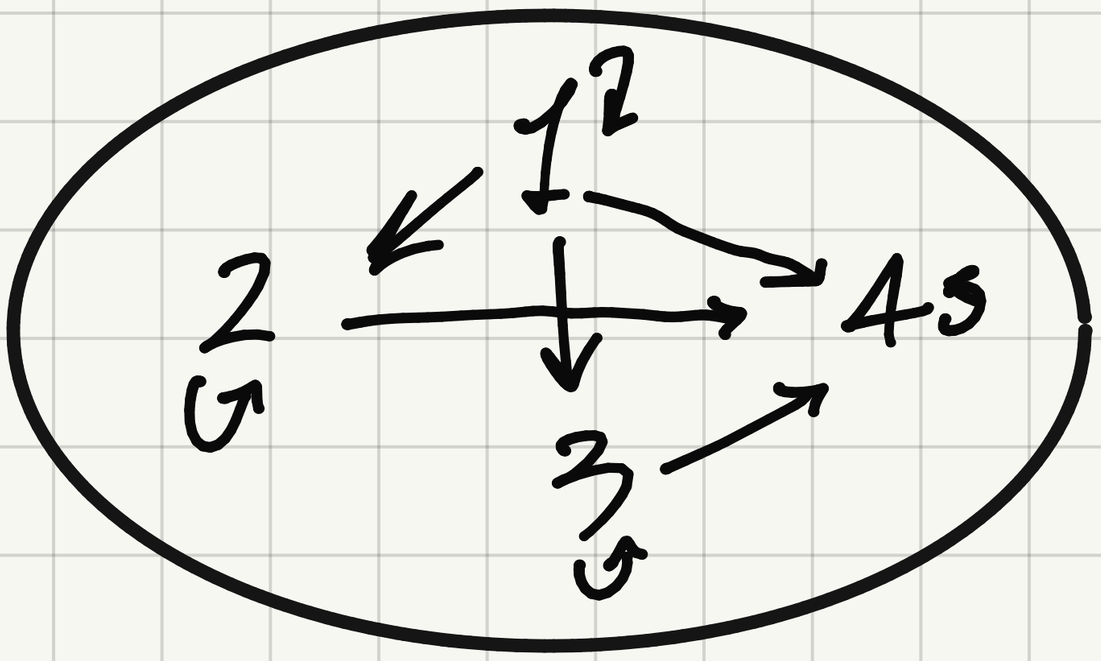
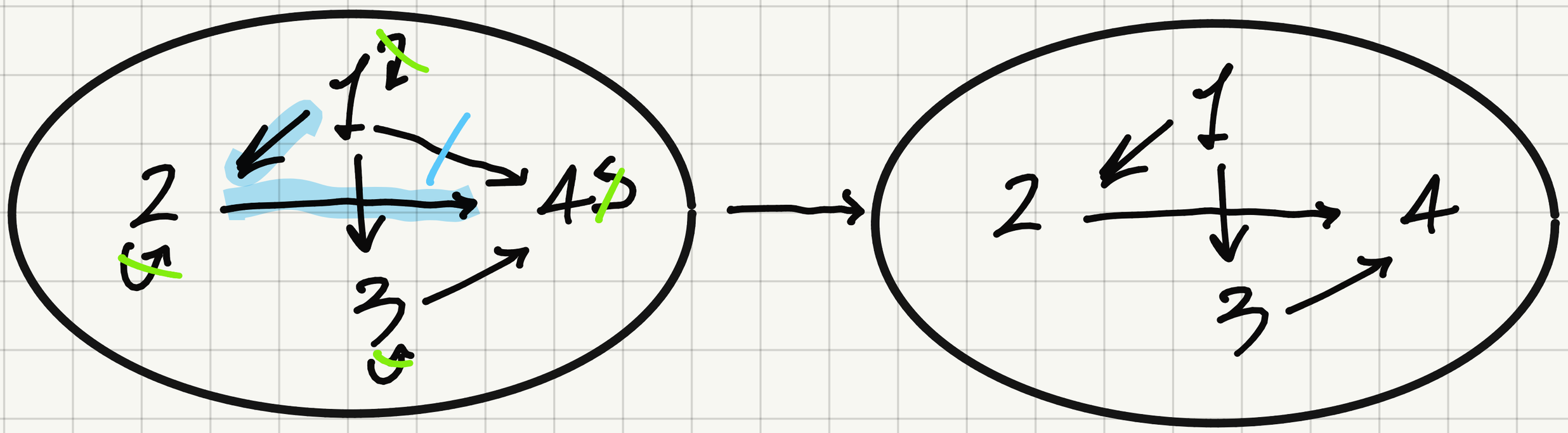
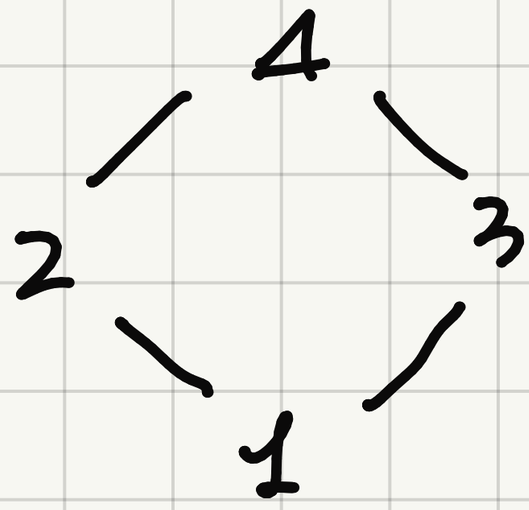


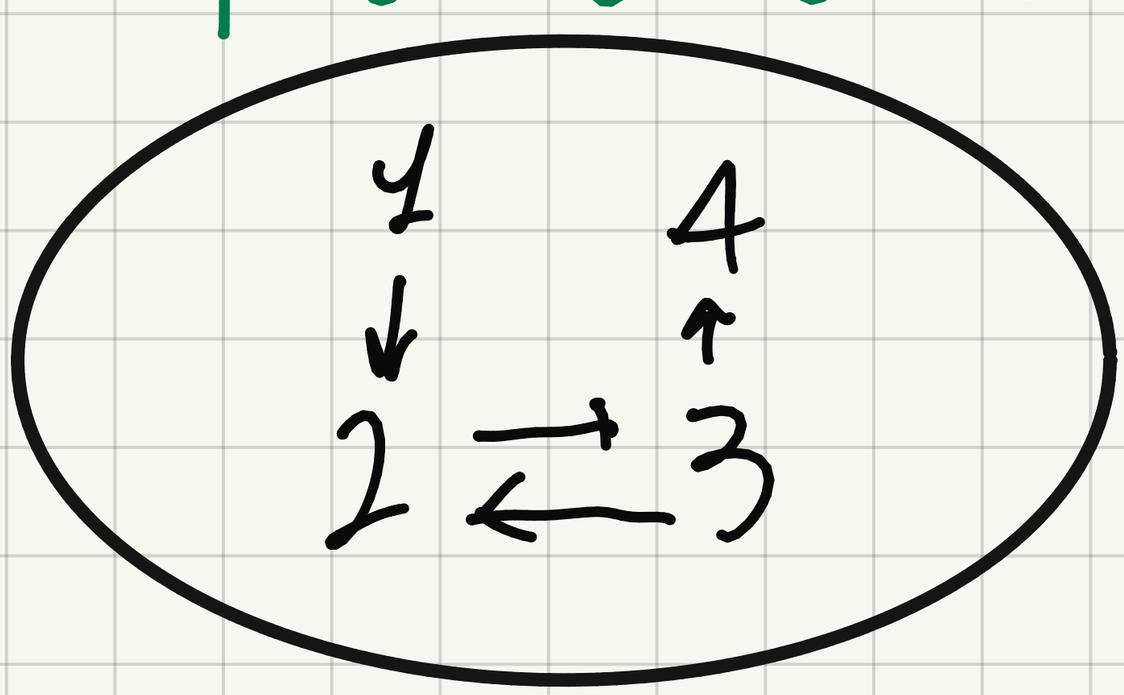
- REFLEXIVITY
- TRANSITIVITY





DETERMINE THE ORDER INDUCED BY THE FOLLOWING RELATIONS $A \to A$ AND FIND HASSE DIAGRAM

a) $$\begin{vmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{vmatrix}$$



$$S = R^{ref} = \begin{vmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 1 \end{vmatrix}$$

$$E = S \cap S^{op} = \begin{vmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 1 \end{vmatrix} \quad n \quad \begin{vmatrix} 1 & 0 & 0 & 0 \\ 1 & 1 & 1 & 0 \\ 1 & 1 & 1 & 0 \\ 1 & 1 & 1 & 1 \end{vmatrix}$$

$$\begin{vmatrix} [1] & [2] & [3] & [4] \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{vmatrix}$$

$A/E = \{[1],[2],[4]\}$

$P: A \to A/E$

$$P = \begin{vmatrix} [1] & [2] & [4] \\ 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{vmatrix} \qquad P^{op} = \begin{vmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{vmatrix}$$

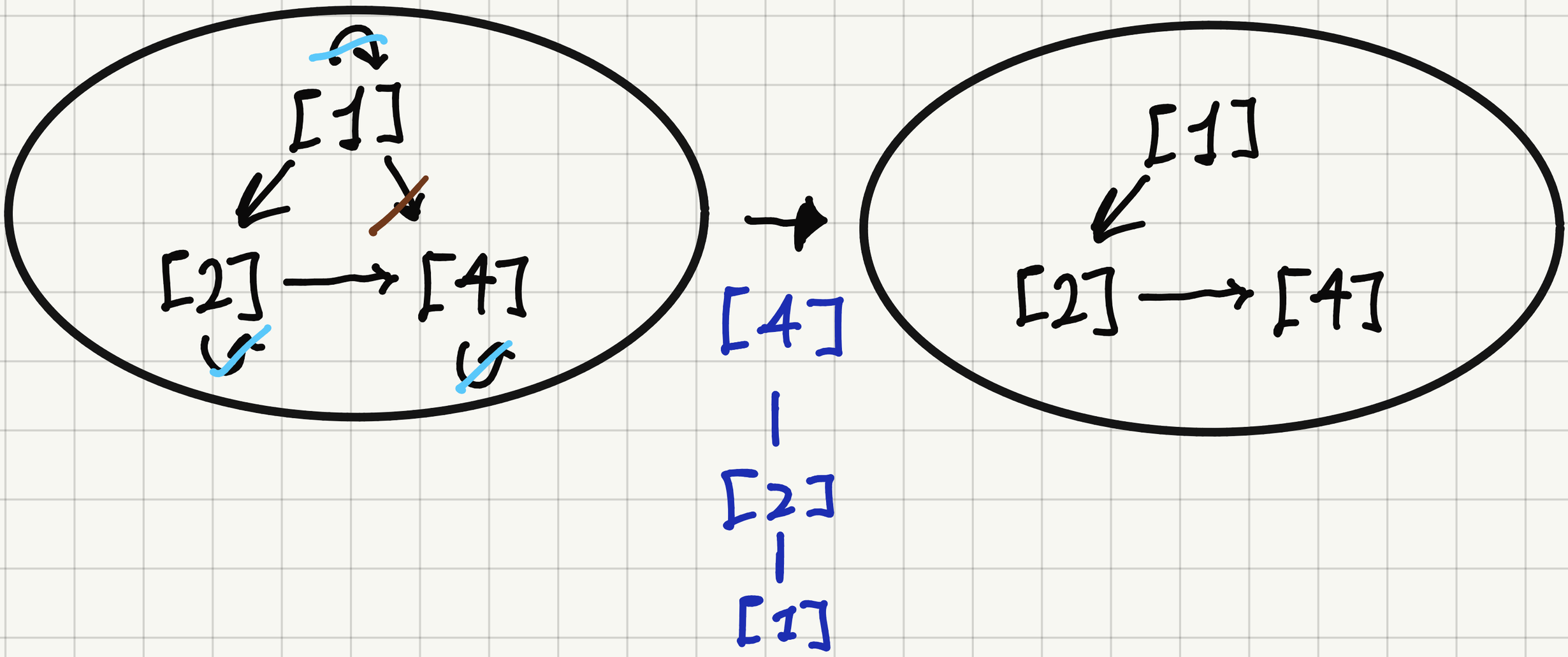
$$\tilde{S} = P^{op} S P = \begin{vmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{vmatrix} \cdot \begin{vmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 1 \end{vmatrix} \cdot \begin{vmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

$$= \begin{vmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 1 \end{vmatrix} \cdot \begin{vmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 1 & 0 \\ 1 & 0 & 1 \end{vmatrix} =$$

	[1]	[2]	[4]
[1]	1	1	1
[2]	0	1	1
[4]	0	0	1

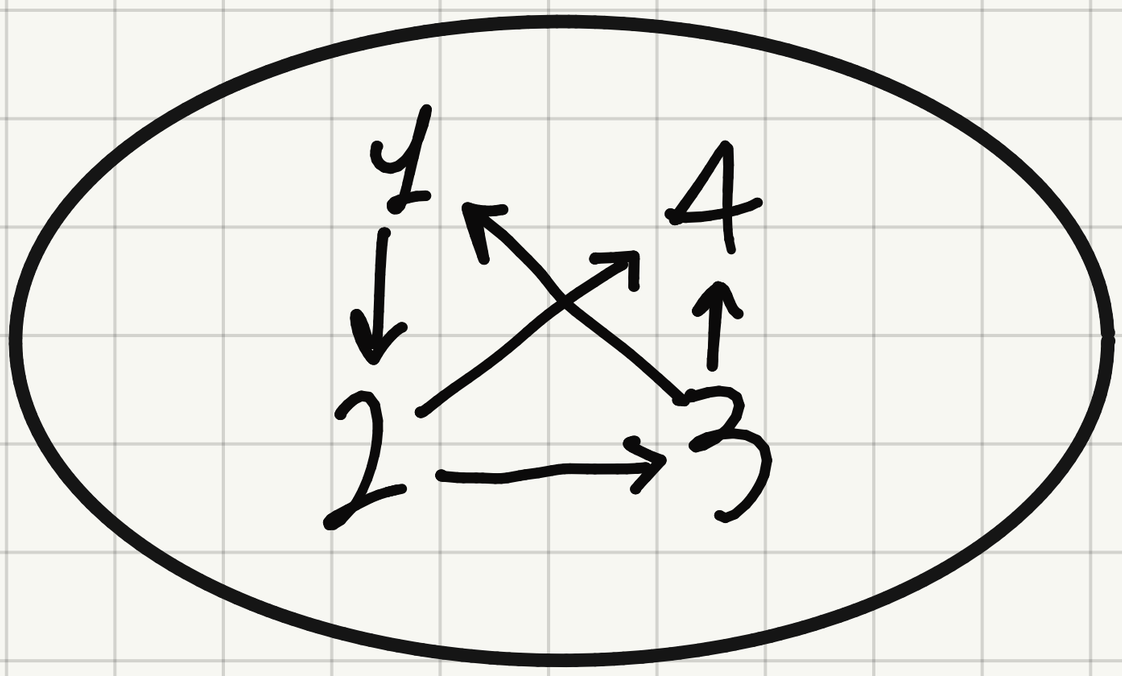
REFLEXIVITY

TRANSITIVITY



b)

0	1	0	0
0	0	1	1
1	0	0	1
0	0	0	0



$S = R^{trc} =$

1	1	1	1
1	1	1	1
1	1	1	1
0	0	0	1

$S^{op} =$

1	1	1	0
1	1	1	0
1	1	1	0
1	1	1	1

$E = SnS^{op} =$

1	1	1	0
1	1	1	0
1	1	1	0
0	0	0	1

$P =$

1	0
1	0
1	0
0	1

$POP =$

1	1	1	0
0	0	0	1