

R	A	B
	{A[1]}	1
2	1	{B[2]}
	1	3

~~R~~ ~~N~~ ~~B~~ S

S	B	C
1		Alice
2		Bob
3		Carol
4		Dave

Rows	A	B	C	φ
	{A ₁ }	1		Alice
	1	{B ₂ }		Alice
	1	3		Carol
	1	{B ₂ }		Bob
	1	{B ₂ }		Carol
	1	{B ₂ }		Dave

2019

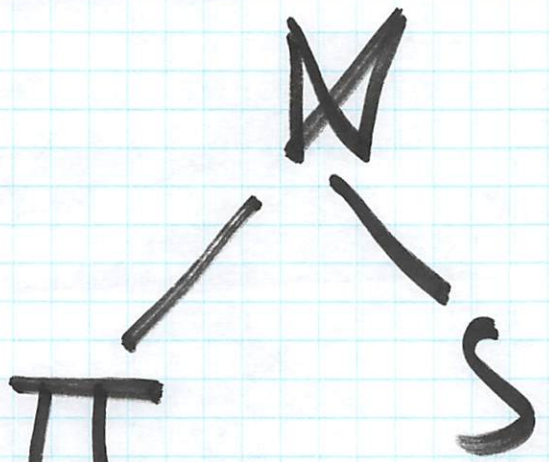
2	1	2
3	1	2
3	1	2

2	1	2
3	1	2
3	1	2
3	1	2
3	1	2
3	1	2

2	1	2
3	1	2
3	1	2
3	1	2
3	1	2
3	1	2

$(\Pi_{MV} R) \bowtie_B (S)$

Guess	var	value
	A_1	= 3
	B_2	= 1
	A_4	= 2
	B_4	= 2



$A \leftarrow \dots$
 $B \leftarrow \dots$
 If $A = \text{Null}$ then $\{\{A_{rowid}\}\}$ else A_{end}

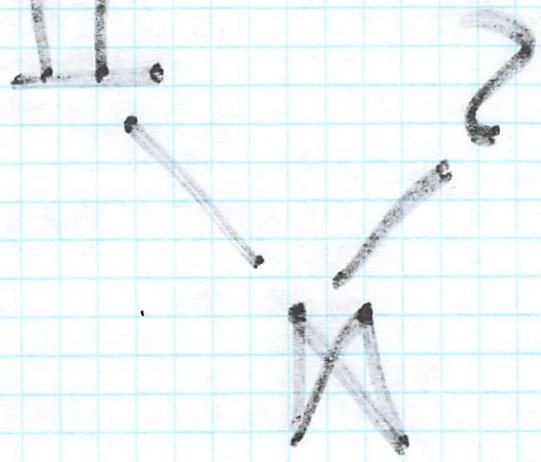
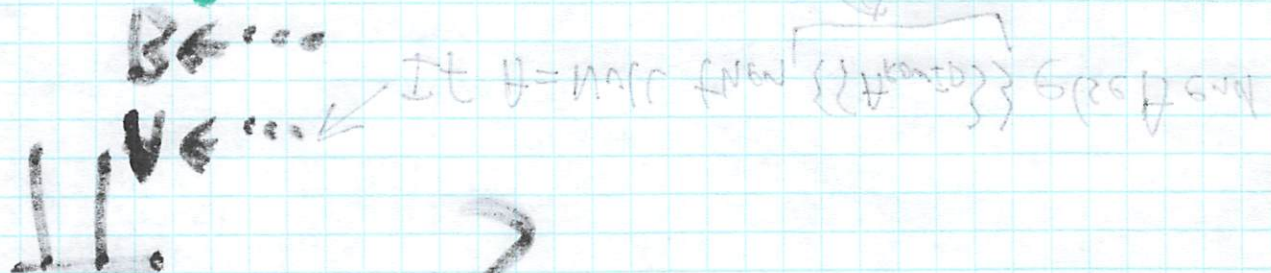
(SELECT value
 FROM GUESS
 WHERE var = A_rowid)

Let $R' = \Pi_{MV} R$
 SELECT A, B, C FROM R', S
 WHERE $R'.B = S.B$

REFLECT 4 BC ABOVE $B_1 = 2B$
 REF $B_1 = \frac{1}{2} B$



WHERE ARE $n_1 = 1$ (empty)
 ABOVE $n_2 = 2$
 REFLECT $n_1 = 1$



$B_1 = 5$
 $B_2 = 5$
 $B_3 = 1$
 $B_4 = 3$

REFLECT $n_1 = 1$

$(\frac{1}{2} B) \quad B \quad (2)$

$\Pi A \leftarrow \text{if } \{A=C\} \text{ then } C \text{ else if } \{A=B\} \text{ then } D \text{ else NULL}$

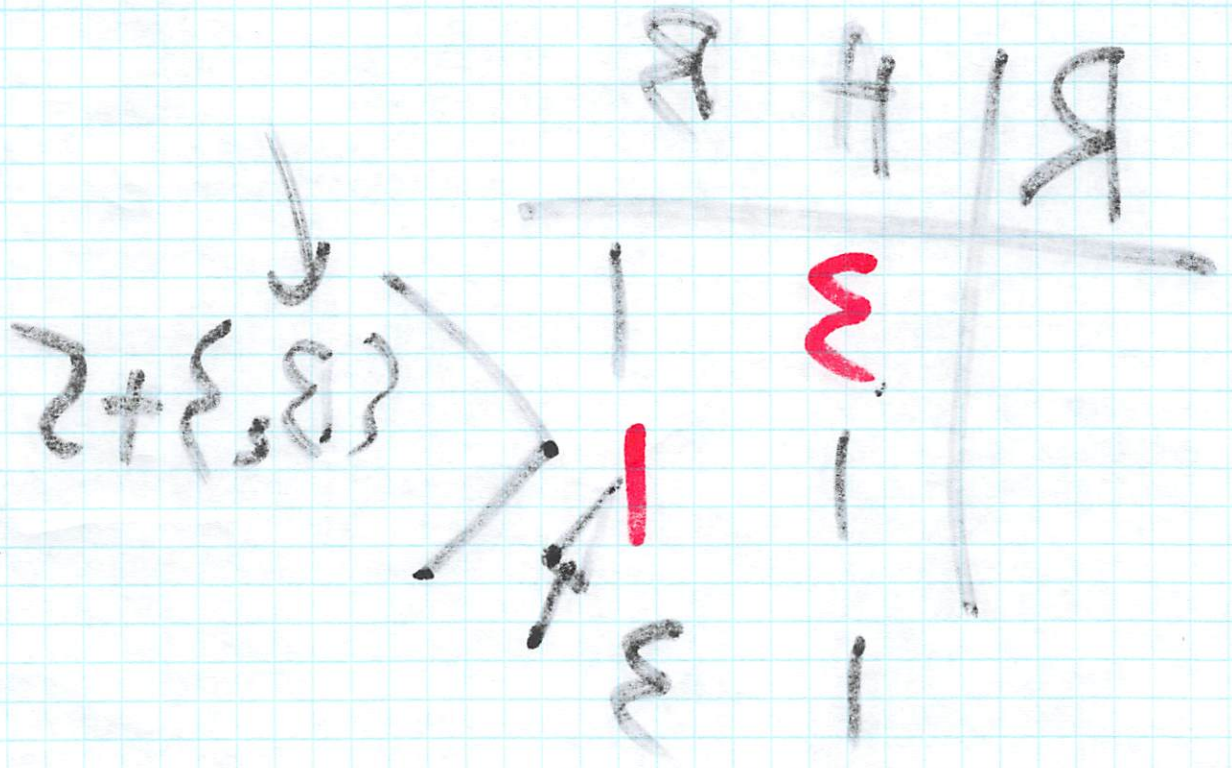
$\Pi A \leftarrow C$

R	A	B
	3	1
	1	1
	1	3

$\{B_2\} + 5$

$\Gamma \rightarrow A \rightarrow B \rightarrow C$ (from a graph) \rightarrow $\Gamma \rightarrow A \rightarrow B \rightarrow C$ (from a graph)

$\Gamma \rightarrow A \rightarrow C$



$R(A, B, \dots)$

$\hookrightarrow \Pi_{A, B, \dots}, A' \in T, B' \in T$
 $\dots, \varphi \in T R$

$\Pi_{A, B, \dots} R$

$A \leftarrow S(B, C, D)$

\uparrow isDet \uparrow isDet

$B' \wedge C' \wedge D' \wedge$

$R(A, B, \dots)$

$T \rightarrow A, \dots, R, A, \dots$
 $R \rightarrow \emptyset, \dots$

$(A \rightarrow B, C, D)$
 R

↑
↑
↑

B, C, D, A

$$(\text{if } \psi \text{ then } x \text{ else } \gamma)' =$$

$$\psi' \wedge ((\psi \wedge x') \vee (\neg \psi \wedge \gamma'))$$

$$(\varphi \wedge \psi)' =$$

$$(\varphi' \wedge \psi') \vee (\varphi' \wedge \neg \varphi) \vee (\psi' \wedge \neg \psi)$$

∴ ∨ ∨ ∨

$$= (\psi \wedge \gamma) \vee (\psi \wedge \gamma)$$

$$(\psi \wedge \gamma) \vee (\psi \wedge \gamma)$$

$$= (\psi \wedge \gamma)$$

$$(\psi \wedge \gamma) \vee (\psi \wedge \gamma) \vee (\psi \wedge \gamma)$$

$$\vdots$$