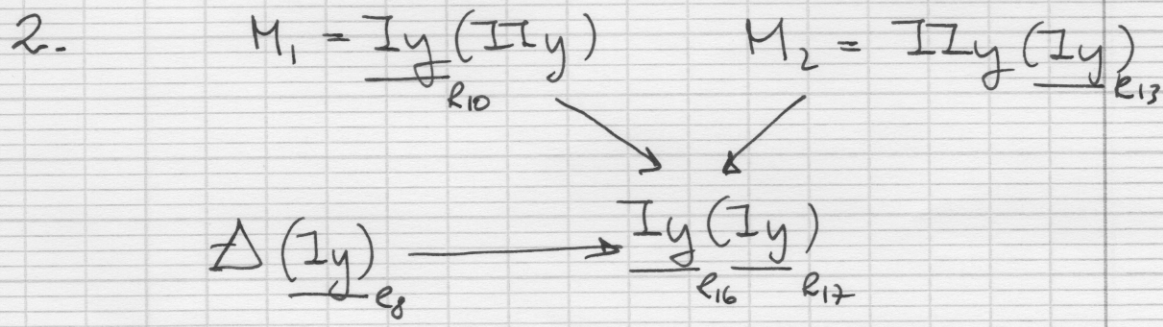
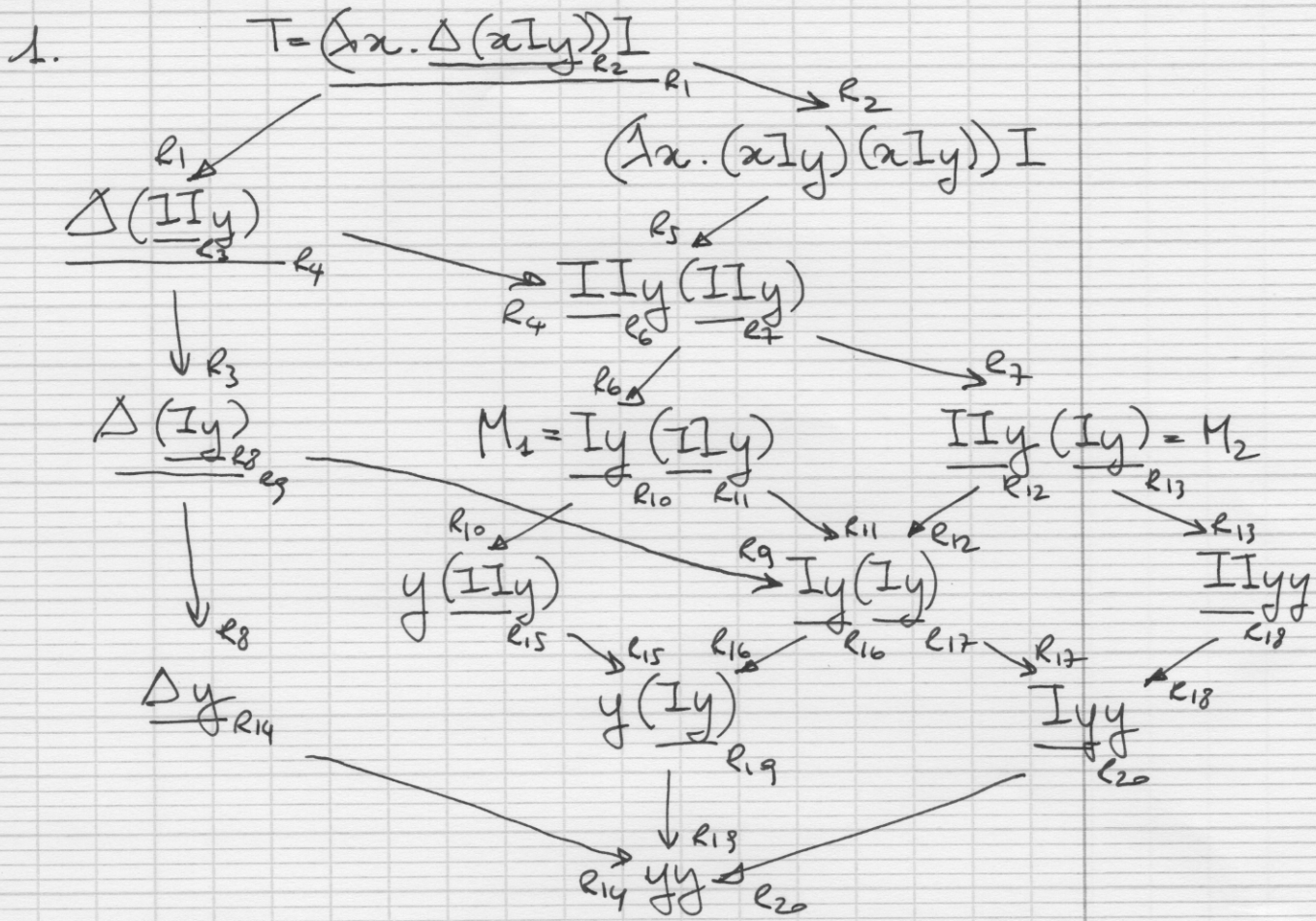


① Lévy's optimal reductions



$$R_1 R_4 R_6 R_{10} \leq R_1 R_4 R_6 R_{11} R_{16} \equiv R_1 R_3 R_9 R_{16} \geq R_1 R_3 R_8$$

$$R_1 R_4 R_7 R_{13} \leq R_1 R_4 R_7 R_{12} R_{17} \equiv R_1 R_3 R_9 R_{17} \geq R_1 R_3 R_8$$

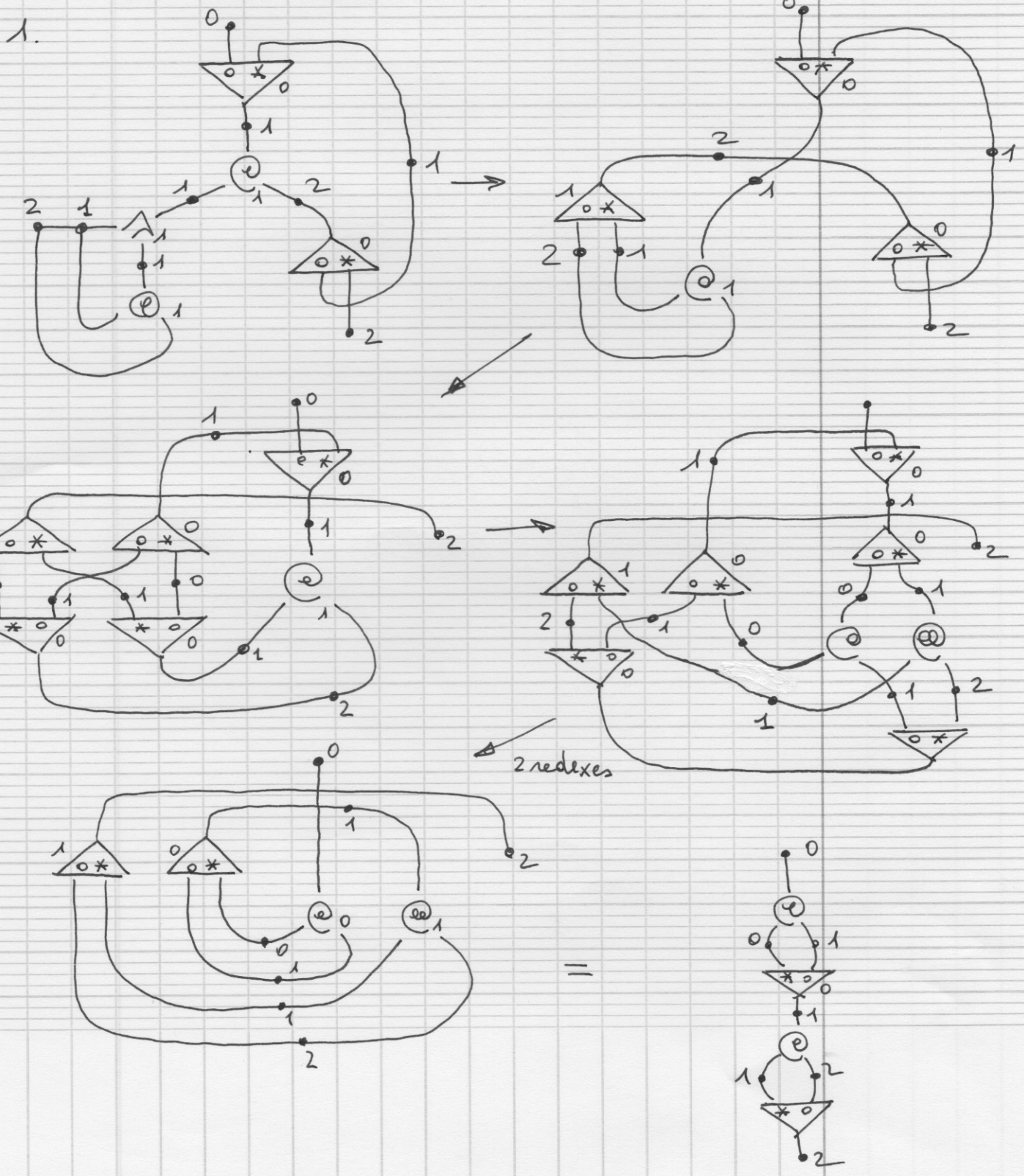
$$R_1 R_4 R_6 R_{10} \approx R_1 R_3 R_8 \approx R_1 R_4 R_7 R_{13}$$

- 3/4. $\{R_1, R_5\}$ $\{R_2, R_4, R_9, R_{14}\}$
 $\{R_3, R_6, R_7, R_{11}, R_{12}, R_{15}, R_{18}\}$ families
 $\{R_8, R_{10}, R_{13}, R_{16}, R_{17}, R_{19}, R_{20}\}$
 R_1, R_2, R_3, R_8 are the canonical representatives

5. $R_1 R_4 R_6 R_{10} \triangleright_4 R_1 R_3 R_8$
 $R_1 R_4 R_7 R_{13} \triangleright_4 R_1 R_3 R_8$

$R_6 R_{10}$ and $R_7 R_{13}$ are internal to instances of the argument of $R_4 = \Delta(I \uparrow y)$

② Showing graphs



2.

