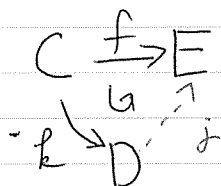
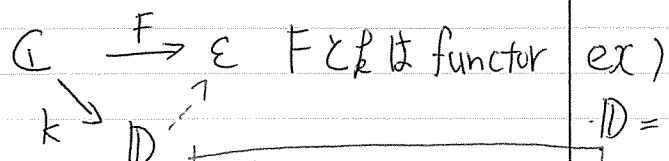


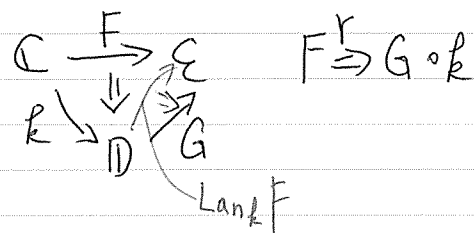
$$C \xrightarrow{f} D \xrightarrow{g} E$$


C, D, E は categories

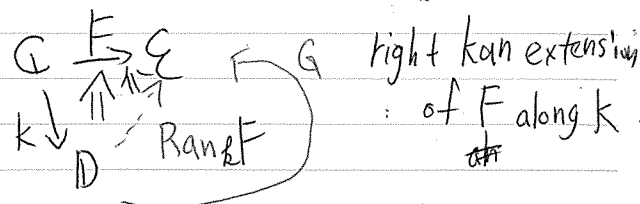


left kan extension of F
along k

$$F \Rightarrow (\text{Lang}_k F) \cdot \frac{1}{k}$$

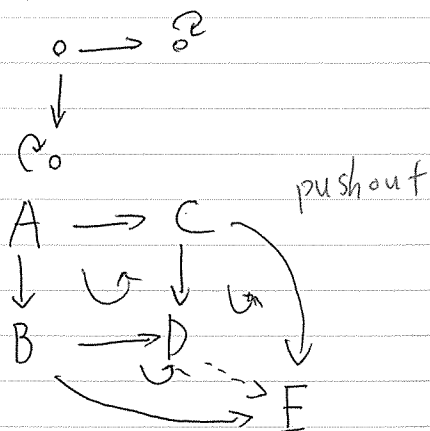
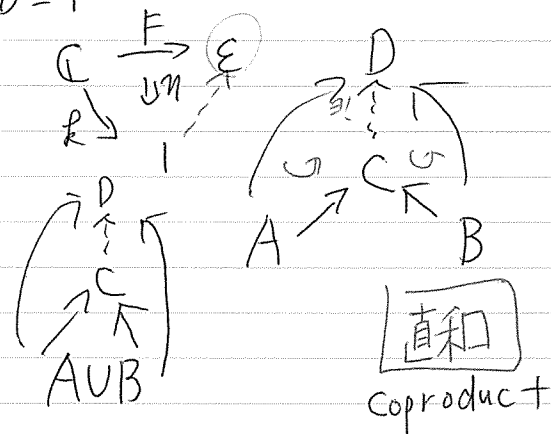


$$\text{Lang}_k F \xrightarrow{\delta} G \quad r = \delta \cdot k$$


$$G \circ k \stackrel{r}{\Rightarrow} F$$

$$r = f \circ k$$

ex)

$$D = 1$$


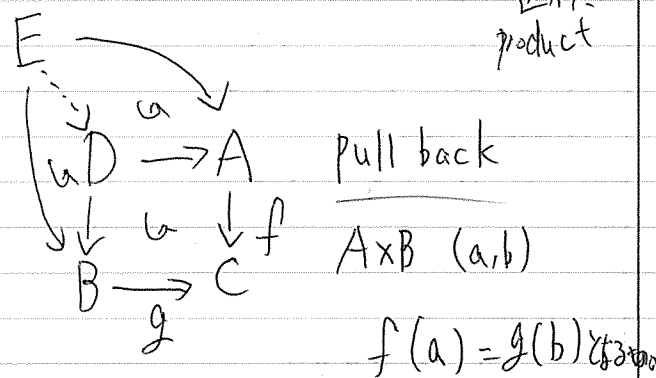
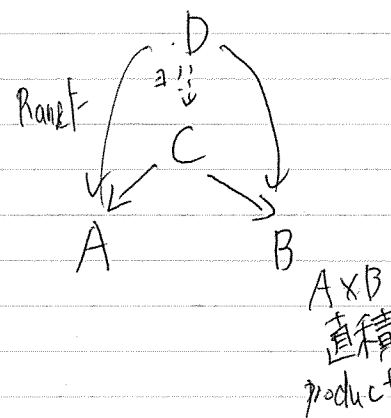
C

initial object.

$$(A) = \text{Lang } F$$



$$\phi \rightarrow A \quad G = \left\{ \begin{pmatrix} 0 & 2 \\ 0 & 0 \end{pmatrix} \right\}$$



$$C = \begin{Bmatrix} 2 \\ 0 \end{Bmatrix} \Rightarrow \begin{Bmatrix} 2 \\ 0 \end{Bmatrix}$$

