

Ex. 1

$$1) \Pi_{\text{name}}(\Pi_{\text{sid}}((\Pi_{\text{pid}}(\sigma_{\text{color}=\text{red}}(\text{Parts})) \bowtie \text{Catalog}) \bowtie \text{Suppliers}))$$

$$2) \Pi_{\text{sid}}(\Pi_{\text{pid}}(\sigma_{\text{color}=\text{red} \vee \text{color}=\text{green}}(\text{Parts})) \bowtie \text{Catalog})$$

$$3) \rho(C_1, \Pi_{\text{pid}}(\sigma_{\text{color}=\text{red}}(\text{Parts})) \bowtie \text{Catalog})$$

$$\rho(C_2, \Pi_{\text{sid}}(\sigma_{\text{address} = "221 \text{ Pocket Street}" }(\text{Suppliers})))$$

$$(C_1 \cup C_2) / (C_1 \cap C_2)$$

$$4) \rho(C_1, \Pi_{\text{sid}}((\Pi_{\text{pid}}(\sigma_{\text{color}=\text{red}}(\text{Parts})) \bowtie \text{Catalog}))$$

$$\rho(C_2, \Pi_{\text{sid}}((\Pi_{\text{pid}}(\sigma_{\text{color}=\text{green}}(\text{Parts})) \bowtie \text{Catalog}))$$

$$C_1 \cap C_2$$

$$5) (\Pi_{\text{sid}, \text{pid}}(\text{Catalog})) / (\Pi_{\text{pid}}(\text{Parts}))$$

$$6) (\Pi_{\text{sid}, \text{pid}}(\text{Catalog})) / (\Pi_{\text{pid}}(\sigma_{\text{color}=\text{red}}(\text{Parts})))$$

$$7) (\Pi_{\text{sid}, \text{pid}}(\text{Catalog})) / (\Pi_{\text{pid}}(\sigma_{\text{color}=\text{red} \vee \text{color}=\text{green}}(\text{Parts})))$$

$$8) \rho(C_1, ((\Pi_{\text{sid}, \text{pid}}(\text{Catalog})) / (\Pi_{\text{pid}}(\sigma_{\text{color}=\text{red}}(\text{Parts}))))$$

$$\rho(C_2, ((\Pi_{\text{sid}, \text{pid}}(\text{Catalog})) / (\Pi_{\text{pid}}(\sigma_{\text{color}=\text{green}}(\text{Parts}))))$$

$$C_1 \cup C_2 \quad (C_1 \cap C_2 = \emptyset)$$



$$9) \quad \rho(A_1, \text{Catalog}) ; \rho(A_2, \text{Catalog})$$

$$\Pi_{A_1.\text{sid}, A_2.\text{sid}} \left( \sigma_{A_1.\text{pid} = A_2.\text{pid} \wedge A_1.\text{sid} \neq A_2.\text{sid} \wedge A_1.\text{cost} > A_2.\text{cost}} (A_1 \times A_2) \right)$$

$$10) \quad \rho(A_1, \text{Catalog}) ; \rho(A_2, \text{Catalog})$$

$$\Pi_{A_1.\text{pid}} \left( \sigma_{A_1.\text{pid} = A_2.\text{pid} \wedge A_1.\text{sid} \neq A_2.\text{sid}} (A_1 \times A_2) \right)$$