

- (b) i. $\Pi_{sname}(Suppliers \bowtie (Catalog \bowtie \sigma_{colour="red"}(Parts)))$
- ii. $\Pi_{sid}(Suppliers \bowtie (Catalog \bowtie \sigma_{colour="red" \vee "green"}(Parts)))$
- iii. $\Pi_{sid}(Suppliers \bowtie (Catalog \bowtie \sigma_{colour="red" \vee "green"}(Parts))) \vee \Pi_{sid}(\sigma_{address="1065MilitaryTrail"}(Suppliers))$
- iv. $\Pi_{sid}(Suppliers \bowtie (Catalog \bowtie \sigma_{colour="red"}(Parts))) \wedge \Pi_{sid}(Suppliers \bowtie (Catalog \bowtie \sigma_{colour="green"}(Parts)))$
- v. $(\Pi_{sid,pid}Catalog) / (\Pi_{pid}Parts)$
- vi. $(\Pi_{sid,pid}Catalog) / (\Pi_{pid}\sigma_{colour="red"}Parts)$
- vii. $\Pi_{sid,pid}(Catalog) / \Pi_{pid}(\sigma_{colour="red" \vee "green"}(Parts))$
- viii. $[(\Pi_{sid,pid}Catalog) / (\Pi_{pid}\sigma_{colour="green"}Parts)] \vee [(\Pi_{sid,pid}Catalog) / (\Pi_{pid}\sigma_{colour="green"}Parts)]$
- ix. $\rho_{\alpha}(Catalog), \rho_{\beta}(Catalog)$
 $\Pi_{\alpha.sid, \beta.sid}(\sigma_{\alpha.pid=\beta.pid \wedge \alpha.sid \neq \beta.sid \wedge \alpha.cost > \beta.cost}(\alpha \times \beta))$
- x. $\rho_{\alpha}(Catalog), \rho_{\beta}(Catalog)$
 $\Pi_{\alpha.pid}(\sigma_{\alpha.pid=\beta.pid \wedge \alpha.sid \neq \beta.sid}(\alpha \times \beta))$
- xi. $R_1 := (\Pi_{sid}(\sigma_{sname="CanadaSuppliers"}(Suppliers))) \bowtie Catalog$
 $\rho_{\alpha}(R_1)$
 $R_2 := \Pi_{\alpha.sid, \alpha.pid, \alpha.cost}(\sigma_{\alpha.cost < R_1.cost}(\alpha \times R_1))$
 $\Pi_{pid}(R_1 - \Pi_{sid,pid,cost}(R_2))$
- xii. $\Pi_{pid,sid}(\sigma_{cost < 200}(Catalog)) / \Pi_{sid}(Suppliers)$