Ex 1

1 $\pi_{sname}(\pi_{sid}((\pi_{pid}\sigma_{color='red'}Parts) \bowtie Catalog) \bowtie Suppliers$

2. $\pi_{sid}((\pi_{pid}\sigma_{color='red' \vee color='green'}Parts) \bowtie Catalog$

3. $\rho(R_1, \pi_{sid}((\pi_{pid}\sigma_{color='red'}Parts) \bowtie Catalog))$
$\rho(R_2, \pi_{sid}\sigma_{address='221 Packer Street'}Supplies)$
$R_1 \cup R_2$

4 $\rho(R_1, \pi_{sid}((\pi_{pid}\sigma_{color='red'}Parts) \bowtie Catalog))$
$\rho(R_2, \pi_{sid}((\pi_{pid}\sigma_{color='green'}Parts) \bowtie Catalog))$
$R_1 \cap R_2$

5. $(\pi_{sid,pid}Catalog) / (\pi_{pid}Parts)$

6. $(\pi_{sid,pid}Catalog) / (\pi_{pid}\sigma_{color='red'}Parts)$

7. $(\pi_{sid,pid}Catalog) / (\pi_{pid}\sigma_{color='red' \vee color='green'}Parts)$

8. $\rho(R1, (\pi_{sid,pid}Catalog) / (\pi_{pid}\sigma_{color='red'}Parts))$
$\rho(R2, (\pi_{sid,pid}Catalog) / (\pi_{pid}\sigma_{color='green'}Parts))$
$R_1 \cup R_2$.

9. $\rho(R1, Catalog)$
$\rho(R2, Catalog)$

$\pi_{R_1.sid, R_2.sid} \sigma_{R_1.pid = R_2.pid \wedge R_1.sid \neq R_2.sid \wedge R_1.cost > R_2.cost} (R_1 \times R_2)$

10. $\rho(R_1, Catalog)$
$\rho(R_2, Catalog)$

$\pi_{R_1.pid} \sigma_{R_1.pid = R_2.pid \wedge R_1.sid \neq R_2.sid} (R_1 \times R_2)$