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Homework #1

1. R − S:

A	B	C
4	5	6
1	2	6

S − R:

A	B	C
2	5	4

R − S ∪ S − R:

A	B	C
4	5	6
1	2	6
2	5	4

2. $\sigma_{(R.A < S.C) \wedge (R.B < S.D)}[R \times S] =$

R		S		
A	B	B	C	D
1	2	2	4	6
1	2	8	6	8
1	2	7	5	9
3	4	2	4	6
3	4	8	6	8
3	4	7	5	9
5	6	8	6	8

3.

a. $\Pi_{\text{customer-name}}\left(\sigma_{\text{branch-name} = \text{'Region12'}}[\text{Account}]\right)$.

b. $\Pi_{\text{cust-name}}[\Pi_{\text{cust-name, branch-name}} - \Pi_{\substack{\text{cust-name,} \\ \text{branch-name}}}(\text{customer} \not\bowtie \text{branch})]$.

c. $\Pi_{\text{branch-name}}(\text{branch}) - \Pi_{\text{branch-name}}(\text{account})$.

d. $\Pi_{\text{customer-name}}[\sigma_{\text{branch-name} != \text{'Region 12'}}(\text{Account})]$.

e. $\Pi_{\text{customer-name}}(\text{customer}) - \Pi_{\substack{\text{cust=} \\ \text{name}}}[\Pi_{\substack{\text{branch-} \\ \text{name}}}(\sigma_{\text{city} = \text{'La Angeles'}}(\text{branch}) \times \Pi_{\substack{\text{cust-name} \\ \text{account-num}}}(\text{Account}) - \text{Account}]$.

f. $\text{Account} - \left(\Pi_{\substack{\text{cust-name} \\ \text{branch-name}}}(\text{Account}) \times \Pi_{\substack{\text{cust-name} \\ \text{acct-num}}}(\text{Account})\right)$.

4. $\Pi_{\text{SID}}\left[\sigma_{\substack{\text{S1 != S2} \\ \text{S1.SID < S2.SID}}}\left(P_{S1}(\text{student}) \times P_{S2}(\text{student})\right)\right]$.