1.1) $\prod_{\text{id, person\_name}}(\sigma_{\text{company\_name = "BigBank"}}(\text{works}))$

1.2) $\prod_{\text{id, person\_name, city}}(\sigma_{\text{company\_name = "BigBank"}}(\text{works}))$
$\bowtie_{\text{works.person\_name=employee.person\_name}} \text{employee})$

1.3) $\prod_{\text{id, person\_name, street, city}}(\sigma_{\text{company\_name = "BigBank" ^ salary > 10000}}(\text{works}))$
$\bowtie_{\text{works.person\_name=employee.person\_name}} \text{employee})$

1.4) joined ← $(\text{works} \bowtie_{\text{works.company\_name=company.company\_name}} \text{company})$

$\prod_{\text{id, person\_name}}$ (joined$\bowtie_{\text{joined.person_name=employee.person_name ^ joined.city=employee.city}}$employee)

2.1) $\prod_{\text{id, person\_name}}(\text{employee}) - \prod_{\text{id, person\_name}}(\sigma_{\text{company\_name = "BigBank"}}(\text{works}))$

2.2) $\prod_{\text{id, person\_name}}(\text{works}) - \prod_{\text{works.id, works.person\_name}}(\text{works} \bowtie_{\text{works.salary} \leq \text{works\_2.salary}} \rho_{\text{works\_2}}(\text{works}))$

3) instructor(ID, name, dept_name, salary)

department(dept_name, building, budget)

Inserting: (22222, Einstein, Physics, 95000)

into the instructor table, where the department table doesn't have the department Physics, would violate the foreign key constraint

Deleting: (Physics, Watson, 70000)

From the department table, where at least one instructor has dept_name as Physics, would violate the foreign key constraint

4) Employee: id, person_name

Works: id, person_name

Company: id, company_name