P1.

1. p1(X,Y,Z) :- r(X,Y,Z); s(X,Y,Z).

2. p2(X,Y,Z) :- r(X,Y,Z), s(X,Y,Z).

3. p3(X,Y,Z) :- r(X,Y,Z), not(s(X,Y,Z)).

4. temp(X,Y,Z) :- r(X,Y,Z); s(X,Y,Z).
    p4(X,Y,Z) :- temp(X,Y,Z), not(t(X,Y,Z)).

5. temp1(X,Y,Z) :- r(X,Y,Z), not(s(X,Y,Z)).
    temp2(X,Y,Z) :- r(X,Y,Z), not(t(X,Y,Z)).
    p5(X,Y,Z) :- temp1(X,Y,Z), temp2(X,Y,Z).

6. p6(X,Y) :- r(X,Y,Z).

7. temp1(X,Y) :- r(X,Y,Z).
    temp2(Y,Z) :- s(X,Y,Z).
    temp3(X,Y) :- temp2(X,Y).
    p7(X,Y) :- temp1(X,Y), temp3(X,Y).

P2.

1. p1(X,Y,Z,A,B,C) :- r(X,Y,Z), s(A,B,C), X = B.

2. p2(X,Y,Z,A,B,C) :- r(X,Y,Z), s(A,B,C), X < B, Y < C.

3. p3(X,Y,Z,A,B,C) :- r(X,Y,Z), s(A,B,C), (X < B; Y < C).

4. temp(X,Y,Z,A,B,C) :- r(X,Y,Z), s(A,B,C), (X < B; X > B).
    p4(X,Y,Z,A,B,C) :- r(X,Y,Z), s(A,B,C), not(temp(X,Y,Z,A,B,C)).

P3.

1. $p := \pi_{\$1,\$2}(q \bowtie_{\$2=\$1} r)$
2. $p := \pi_{q1.X,q2.Y}(\sigma_{q1.X,q2.Y}(\rho_{q1}(q) \times \rho_{q2}(q)))$
3. $p := \pi_{\$1,\$2}(q \bowtie_{\$2=\$1 \land \$1<\$2} r)$

P4.

```
CREATE TABLE parent (
        NameA varchar(40) not null,
        NameB varchar(40) not null
);

CREATE VIEW Ancestor AS (
        WITH RECURSIVE Ancestor AS (
                ( SELECT NameA, NameB
                  FROM Parent )
                UNION
                ( SELECT P.NameA, A.NameB
                  FROM Parent P, Ancestor A
                  WHERE P.NameB = A.NameA ))
        SELECT *
        FROM Ancestor
);
```