CMSC 23500 Introduction to Database Systems
Spring 2009 S. Salveter

Homework 2
Due Wednesday 15 April 2009 7:00 pm
Hard copy due Thursday 16 April in class

1. Exercise 6.16 page 214 of the text.

2. The divide operator ÷ is not a primitive operator in the relational algebra.
   Express p ÷ q in terms of the complete set of relational operators { σ , π , $\cup$, $-$, $\times$}.

3. Assume the following relations (the foreign key constraint is not enforced):

customer

number	name	rating	salesperson
1	smith	5	101
2	jones	7	101
3	wei	10	103

salesperson

number	name	office
101	johnson	23
102	miller	26

    a. Compute customer LOJ$_{salesperson=number}$salesperson
        where LOJ is the left outer join operator

    b. Compute customer ROJ$_{salesperson=number}$salesperson
        where ROJ is the right outer join operator

    c. Compute customer FOJ$_{salesperson=number}$salesperson
        where FOJ is the full outer join operator