Solutions: Problem Set 4

5.1.3 pts 1
set: {15, 16, 14, 18}
bag: {15, 16, 14, 16, 15, 15, 14, 18}

5.2.1
a) (A+B, A^2, B^2)={(1,0,1),(5,4,9),(1,0,1),(6,4,16),(7,9,16)}
b)(B+1,C-1)={(1,0),(3,3),(3,4),(4,3),(1,1),(4,3)};
d) [(0,1),(0,2),(2,4),(2,5),(3,4),(3,4)]
pts 0.5 each - 1.5

5.1.4
a) The order in which a union is made does not matter since both expressions will output the same number of elements: (r + s) + t = r + (s + t)
c) This behaves the same way in bags, with the only difference that bags allow duplicates. First we compute R X S and this results in the tuples RS that have the same value on the common attributes. Then we compute RS X T and this will result in the tuples that have the same value on the common attributes. On the right side the same process is applied in a different order but it will have the same result showing all the tuples of R, S, and T that have the same value on the common attributes.

d) Similar to a.

 Pts: - each1- 3

6.3.2 a b
a)
select country
from Classes
        where numguns = (select MAX(numguns) from Classes)

select country
from Classes
where numGuns >= All (select numGuns from Classes)

select country
from Classes c1
where exists (select country, numguns
      from Classes c2
      where c2.numguns = (select MAX(numguns) from Classes) and c1.country = c2.country

b)

```
select distinct class
from Ships
where exists ( select ship, result
                    from Outcomes
                    where result = 'sunk' and Ships.name = ship)


select distinct class
from Ships
where Ships.name IN (select ship
                        from Outcomes
                         where result  = 'sunk')
```

d)

pts: 1 each - 3

```
select battle
from Outcomes, Ships
where ship=name and class='Kongo';

select battle
from Outcomes
where ship in
(select name
from Ships
where class='Kongo');
```

6.3.5
a)

 pts: 1.5

```
Select name, address
from Moviestar
where gender='F' and (name, address) in
(select name, address
from MovieExec
where netWorth>10000000);
```

total 10