5) a) Let $x=2$, $y=2$
$xy = 4 \geq 1$ and thus $(2,2) \in R$.
Therefore, not irreflexible.

b) x and y will never be the same value.
Since (x,x) or (y,y) do not exist, they can never be $\in R$. Therefore, it is irreflexible.

c) Given any $a \in A$, we have $(a,a) \in R$ and $(a,a) \in S$
The relation $R-S$ becomes $\{(x,y) : x,y \in A \wedge (x,y) \in R \wedge (x,y) \notin S\}$
Since both R and S are reflexive, the is no pair (x,y) that we can eliminate and thus there is no pair in $R-S$, making it irreflexible.

6) a) Due to the fact that R is transitive,
$R^2 \subset R$ and thus $R^n \subset R$ (induction).... $R^+ = \cup_n R^n = R$
$R^* = R = \{(x,y) : y-x \geq 0\}$

b) For R^2, we do $R \circ R = \{(x,z) : \exists y \, (y-x \geq 1) \wedge (z-y) \geq 1\}$
$R^2 = \{(x,z) : z-x \geq 2\}$ Now by induction, we get
$R^n = \{(x,z) : z-x \geq n\}$

7) $R^* = \{(a,a), (a,c), (b,b), (b,d), (c,a), (c,c), (d,b), (d,d), (e,b), (e,d)\}$

8) If we choose R to be $\{(1,2), (3,2)\}$ on $1, 2, 3$
Transtive clos $= \{(1,2), (3,2)\}$
Reflexive clos $= \{(1,1), (2,2), (3,3), (1,2), (3,2)\}$
Symmetric clos $= \{(1,1), (1,2), (2,1), (2,2), (2,3), (3,2), (3,3)\}$
$(1,3)$ is not part of the set and so the conclusion is not transitive. Since it is not transitive, the conditions for an equivalence relation are not satisfied.