# Homework 20, Section 4.4: 3, 6, 14

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## Homework

### 3. A)

Since $(1, 3) \in R_1$ $R_1$ is not antisymmetric

### 3. B)

Since $(1, 2) \in R_2$ and $(2, 1) \in R_2$ $R_2$ is not antisymmetric

### 3. C)

Proof.
Let $(x, y) \in R_3$ be given. This means that $xy + y = y(a + 1)$ is odd. If y is odd then $a + 1$ is odd. Since, they are both even though we know this is supposed to be even. This means $(x, y) \notin R_3$ meaning $R_3$ is antisymmetric

### 6. A)

$R_1$ is irreflexive, antisymmetric and not transitive.

### 6. B)

$R_2$ is irreflexive, antisymmetric and transitive.

### 14. A)

**14. B)**

**14. C)**