Assignment_06

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4.

	Reflexive	Symmetric	Anti-symmtric	Transitive
(a)	No	No	Yes	Yes
(b)	Yes	Tes	No	Yes
(c)	Yes	Yes	No	Yes
(d)	Yes	Yes	No	No

12.

(a)

32.

$$\{(1,1),(1,2),(2,1),(2,2)\}$$

34.

a)

$$R_1 \cup R_3 = \left\{(a,b) \in \mathbb{R}^2 \mid (a > b) \vee (a < b)\right\} = \\ \left\{(a,b) \in \mathbb{R}^2 \mid a \neq b\right\}$$

b)

$$R_1 \cup R_5 = \left\{(a,b) \in \mathbb{R}^2 \mid (a > b) \vee (a = b)\right\} = \\ \left\{(a,b) \in \mathbb{R}^2 \mid a \geq b\right\}$$

c)

$$R_2 \cap R_4 = \{(a,b) \in \mathbb{R}^2 \mid (a \leq b) \wedge (a \geq b)\} =$$
$$\{(a,b) \in \mathbb{R}^2 \mid a = b\}$$

d)

$$R_3 \cap R_5 = \{(a,b) \in \mathbb{R}^2 \mid (a < b) \wedge (a = b)\} = \emptyset$$

e)

$$R_1 - R_2 = \{(a,b) \in \mathbb{R}^2 \mid (a > b) \wedge \neg(a \geq b)\} =$$
$$\{(a,b) \in R \mid (a > b) \wedge (a < b)\} = \emptyset$$

f)

$$R_2 - R_1 = \{(a,b) \in R \mid (a \geq b) \wedge \neg(a > b)\} =$$
$$\{(a,b) \in \mathbb{R}^2 \mid (a \geq b) \wedge (a \leq b)\} = \{(a,b) \in \mathbb{R}^2 \mid a = b\}$$

g)

$$R_1 \oplus R_3 = (R_1 \cup R_3) - (R_1 \cap R_3) =$$
$$\{(a,b) \in \mathbb{R} \mid ((a > b) \vee (a < b)) \wedge \neg((a > b) \wedge (a < b >))\} =$$
$$\{(a,b) \in \mathbb{R} \mid a \neq b\}$$

h)

$$R_2 \oplus R_4 = \{(a,b) \in \mathbb{R}^2 \mid (R_2 \cup R_4) \wedge \neg(R_2 \cap R_4)\} =$$
$$\{(a,b) \in \mathbb{R}^2 \mid a \neq b\}$$