

1. a) $R = \{(4, 4), (1, 1), (3, 3), (2, 2)\}$
1. b) R is reflexive
1. c) R^* is not required
1. a) $R = \{('c', 'c'), ('a', 'a')\}$
1. b) R is not reflexive
1. c) $R^* = \{('d', 'd'), ('c', 'c'), ('a', 'a'), ('b', 'b')\}$

2. a) $R = \{(4, 4), (1, 2), (3, 3), (2, 1)\}$
2. b) R is symmetric
2. c) R^* is not required
2. a) $R = \{(1, 2), (3, 3)\}$
2. b) R is not symmetric
2. c) $R^* = \{(1, 2), (2, 1), (3, 3)\}$

3. a) $R = \{('a', 'c'), ('d', 'd'), ('a', 'b'), ('b', 'c')\}$
3. b) R is transitive
3. c) R^* is not required
3. a) $R = \{(2, 2), (3, 1), (1, 1), (1, 3), (3, 2)\}$
3. b) R is not transitive
3. c) $R^* = \{(1, 2), (2, 1), (3, 1), (1, 1), (2, 3), (3, 3), (2, 2), (3, 2), (1, 3)\}$

4. a) $R = \{(2, 3), (1, 1), (2, 2)\}$
4. b) R is not an equivalence relation
4. c) This is because R is not reflexive is not symmetric is transitive
4. a) $R = \{('c', 'b'), ('c', 'c'), ('a', 'a'), ('b', 'c'), ('b', 'b')\}$
4. b) R is an equivalence relation
4. c) This is because R is reflexive is symmetric is transitive

5. a) $S = \{1, 2, 3, 4\}$
5. b) $R = \{(4, 4), (1, 2), (3, 3), (2, 2), (1, 1), (4, 1), (4, 2)\}$
5. c) (S/R) is a poset
5. d) This is because R is reflexive is antisymmetric is transitive
5. a) $S = \{0, 1, 2, 3\}$
5. b) $R = \{(0, 1), (1, 2), (0, 0), (1, 1), (0, 3), (2, 0), (0, 2), (3, 3), (2, 2), (1, 0), (1, 3)\}$
5. c) (S/R) is not a poset
5. d) This is because R is reflexive is not antisymmetric is not transitive