

1.d

a) $R = [(1, 1), (4, 4), (2, 2), (3, 3)]$

b) R is reflexive: True

1.e

a) $R = [('a', 'a'), ('c', 'c')]$

b) R is reflexive: False

c) R^* if not reflexive: $[('a', 'a'), ('c', 'c'), ('d', 'd'), ('b', 'b')]$

2. Ex 1:

a) $R = [(1, 2), (4, 4), (2, 1), (3, 3)]$

b) R is symmetric: True

Ex 2:

a) $R = [(1, 2), (3, 3)]$

b) R is symmetric: False

c) R^* if not symmetric: $[(1, 2), (3, 3), (2, 1)]$

3. Ex 1:

a) $R = [('a', 'b'), ('d', 'd'), ('b', 'c'), ('a', 'c')]$

b) R is transitive: True

Ex 2:

a) $R = [(1, 1), (1, 3), (2, 2), (3, 1), (3, 2)]$

b) R is transitive: False

c) R^* if not transitive: $[(1, 1), (1, 3), (2, 2), (3, 1), (3, 2), (1, 2), (3, 3)]$

4. Ex 1:

a) $R = [(1, 1), (2, 2), (2, 3)]$

b) R is not an equivalence relation

It is not reflexive

It is not symmetric

Ex 2:

a) $R = [('a', 'a'), ('b', 'b'), ('c', 'c'), ('b', 'c'), ('c', 'b')]$

b) R is an equivalence relation

5. Ex 1:

a) $S = \{1, 2, 3, 4\}$

b) $R = [(1, 1), (1, 2), (2, 2), (3, 3), (4, 1), (4, 2), (4, 4)]$

c) (S, R) is a poset: True

Ex 2:

a) $S = \{0, 1, 2, 3\}$

b) $R = [(0, 0), (0, 1), (0, 2), (0, 3), (1, 0), (1, 1), (1, 2), (1, 3), (2, 0), (2, 2), (3, 3)]$

c) (S, R) is a poset: False

d) (S, R) isn't a poset because it is not antisymmetric

d) (S, R) isn't a poset because it is not transitive