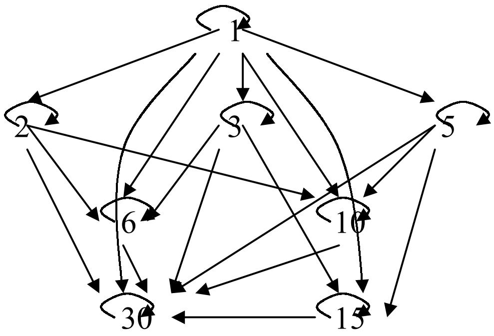
4. Given a set A that is not empty and R that is an empty set,
R is symmetric, because for every ordered pair <x, y>, <x, y> ∉ R.
Also, R is transitive, because for every ordered pairs <x, y> and <y, z>, <x, y> ∉ R and <y, z> ∉ R.
However, R is not reflexive, because it is not the case that for every x ∈ A, <x, x> ∈ R.
Therefore, reflexivity is not a consequence of symmetry and reflexivity.

5. A = {1, 2, 3, 5, 6, 10, 15, 30},   R = {<x, y> | x divides y without remainder}
(a) R = {<1, 1>, <1, 2>, <2, 2>, <1, 3>, <3, 3>, <1, 5>, <5, 5>, <1, 6>, <2, 6>, <3, 6>, <6, 6>, <1, 10>, <2, 10>, <5, 10>, <10, 10>, <1, 15>, <3, 15>, <5, 15>, <15, 15>, <1, 30>, <2, 30>, <3, 30>, <5, 30>, <6, 30>, <10, 30>, <15, 30>, <30, 30>}
R is a weak order because it is transitive, reflexive, and antisymmetric, but it is a partial order because it is non-connected.

(b)



The element 30 is maximal and greatest.
The element 1 is minimal and least.

(c) ℘(B) = {∅, {a}, {b}, {c}, {a, b}, {b, c}, {a, c}, {a, b, c}}
R = {<∅, ∅>, <∅, {a}>, <∅, {b}>, <∅, {b}>, <∅, {a, b}>, <∅, {b, c}>, <∅, {a, c}>, <∅, {a, b, c}>, <{a}, {a}>, <{a}, {a, b}>, <{a}, {a, c}>, <{a}, {a, b, c}>, <{b}, {b}>, <{b}, {a, b}>, <{b}, {b, c}>, <{b}, {a, b, c}>, <{c}, {c}>, <{c}, {a, c}>, <{c}, {b, c}>, <{c}, {a, b, c}>, <{a, b}, {a, b}>, <{a, b}, {a, b, c}>, <{b, c}, {b, c}>, <{b, c}, {a, b, c}>, <{a, c}, {a, c}>, <{a, c}, {a, b, c}>, <{a, b, c}, {a, b, c}>}
The element {a, b, c} is maximal and greatest.
The element ∅ is minimal and least.