1. (a) It is distributive law.
2. (c) Here *A* and *B* sets having 2 elements in common, so  and  have  *i.e.*, 4 elements in common.

Hence, .

1. (c) In general,



is true, if *A* = *B*.



1. (a) It is obvious.
2. (b) ;



.



1. (c)



.



1. b) , 



⇒ .



1. (c) It is obvious.
2. (b) 



.

1. (a) 

So, the total number of subsets of  is  and asubset of  is a relation over the set *A*.

1. (d) it is obvious
2. (b) 

.

1. (b) *R* = {(2, 1), (4, 2), (6, 3),......}.

So,  = {(1, 2), (2, 4), (3, 6),.....}.

1. (b) Since 

 ,  Relation is transitive,

 does not give ,

 Relation is not symmetric.

Since  does not hold, hence relation is not reflexive.

1. (c) .
2. (a) It is obvious.
3. (c) *R* be a relation on *N* defined by .

∴ 

Hence, Domain of .

1. (a) *R* is a relation from {11, 12, 13}to {8, 10, 12} defined by 

∴ *R* = {11, 8},{13, 10}.

Hence, .

1. (a) It is obvious.
2. (a) (1, 1)(2, 2)(3, 3)(4, 4) ; ∴ *R* is reflexive.

 (1, 2) (3, 1)and also (2, 1)(1, 3) .

Hence, *R* is symmetric. But clearly *R* is not transitive.]

1. (c) Since (1, 1)so, is not reflexive.

Now (1, 2) but (2,1) , therefore *R* is not symmetric Clearly *R* is transitive.

1. (b) The void relation *R* on *A* is not reflexive as (*a*, *a*)for any . The void relation is symmetric and transitive.
2. (d) It is obvious.
3. (c) Given *A* = {1, 2, 3, 4}

*R* = {(1, 3), (4, 2), (2, 4), (2, 3), (3, 1)}

(2, 3) ∈ *R* but (3, 2) ∉ *R*. Hence *R* is not symmetric.

*R* is not reflexive as (1, 1) ∉ *R*.

*R* is not a function as (2, 4) ∈ *R* and (2, 3) ∈ *R*.

*R* is not transitive as (1, 3) ∈ *R* and (3, 1) ∈ *R* but (1, 1) ∉ *R*.

1. (a) ; 

∴ *A* × *B* contains  elements.

Hence, number of relations from *A* to *B* .

1. (b) *A* × *B* = {(2, 7), (2, 8), (2, 9), (4, 7), (4, 8), (4, 9), (5, 7), (5, 8), (5, 9)}

*n*(*A* × *B*) = *n*(*A*) . *n*(*B*) = 3 × 3 = 9.

1. (b)  and  .
2. (c) Here  = 2 × 3 = 6

Since every subset of *A* × *B* defines a relation from *A* to *B,* number of relation from *A* to *B* is equal to number of subsets of .

1. d) Given, is relatively prime to *y*.

∴ Domain of .

1. (a) Clearly, *A* = {2, 3}, *B* = {2, 4}, *C*  = {4, 5}

*B* ∩ *C*  = {4}

 *A*  × (*B* ∩ *C*) = {(2, 4); (3, 4)}.