1.

Equivalence relations: a, b (because  and  are obviously in the set and they are all of the same age and have the same parents. Thus, they are transitive.)

c. transitive

d. transitive

e. transitive

2.

Reflexive: obviously, for all . Thus, , it is reflexive.

Symmetric: If , then  is still true, because  still holds. Thus, it is symmetric.

Transitive: If , then .

This is equivalent to .

Thus, , it is transitive.

Hence, R is an equivalence relation.



3.

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 

4.

A. 

B. 

C. 

D. 

E. 

F.

5.

1. 
2. 
3. 

6.

1. 
2. 
3. 

7.

1. 
2. 
3. 
4. 

8.

A.



B.



C.

D.



9.

The divisors of 6 other than itself are 1,2,3, and . Thus, 6 is perfect.

The divisors of 28 other than itself are 1,2,4,7,14 and . Thus, 28 is perfect.



B.

Obviously, the divisors of  other than itself are .

Since  is prime, the divisors of  other than itself are ,

 and .

And 

Thus, , which means it equals to the sum of its factors other than itself.



10.

1. 
2. 
3. 
4. 
5. 
6. 