Genetics problems for practice

1. Brown eyes are fully dominant to blue eyes. What proportion of brown-eyed and blue-eyed children will be born to a couple with the following genotypes:

BB and bb
Bb and bb
Bb and Bb

2. What is the chance that a man with type AB blood and a woman with type O blood can produce a child who is:

type A
type B
type AB
type O

3. Sickle cell anemia (SCA) is a human genetic disease caused by a recessive allele. A couple plans to marry and wants to know the probability that they will have an affected child. What is the probability that they will have an affected child if:

a. both are normal themselves, but each has an allele for sickle cell anemia? (what are the genotypes of the parents?)

b. the man has sickle cell anemia but the woman is healthy and does NOT have the allele for SCA

4. Assume that having dimples is dominant to not having dimples, and having a cleft chin is dominant to having a smooth chin. A woman has no dimples and has a cleft chin although her father did not. A man has dimples AND a cleft chin, and is heterozygous for both traits. Neither of these traits is sex-linked.

What is the chance that their child will have:

no dimples AND no cleft chin
dimples and a cleft chin
dimples but no cleft chin
cleft chin but no dimples

5. Severe combined immune deficiency syndrome (SCID) is a sex-linked recessive condition. A healthy man and woman have a son who has SCID. What must be the genotypes of the man and woman?

The woman's parents were both healthy. Which of her parents had the allele for SCID, her mother or father? How do you know?