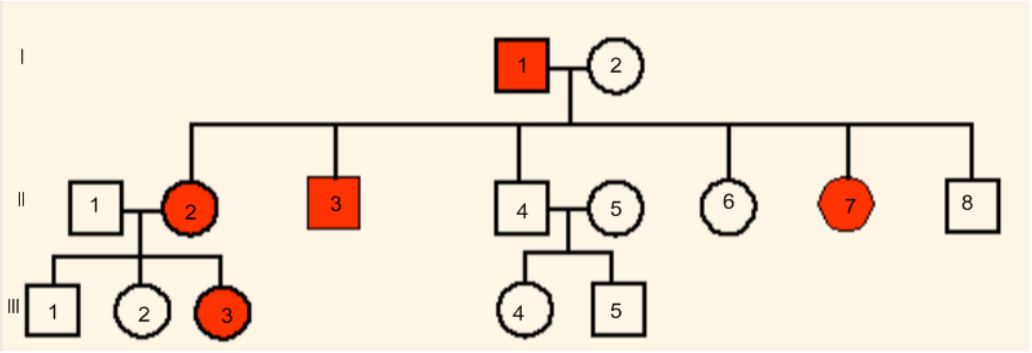

= Huntington's Disease

1. Which members of the family above are afflicted with Huntington's Disease? _____

2. With this in mind, is Huntington's disease caused by a dominant or recessive trait? _____

3. How many children did individuals I-1 and I-2 have? _____

4. How many girls did II-1 and II-2 have? _____ How many have Huntington's Disease? _____

5. How is individual III-2 and II-4 related? _____ I-2 and III-5? _____

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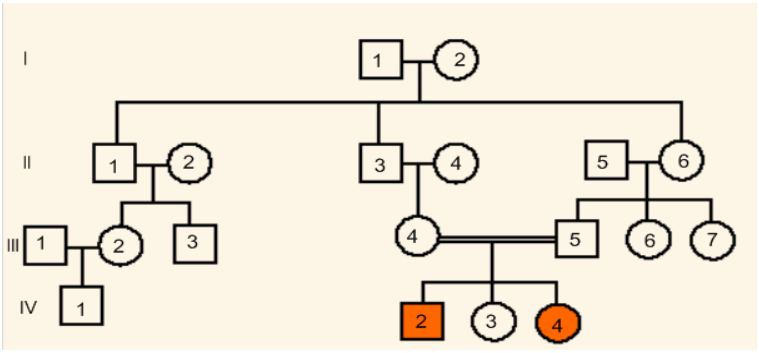
6. The pedigree to the right shows the passing on of Hitchhiker's Thumb in a family. Is this trait dominant or recessive? _____

7. How do you know? _____

8. How are individuals III-1 and III-2 related? _____

9. Name 2 individuals that have hitchhiker's thumb. _____

10. Name 2 individuals that were carriers of hitchhiker's thumb. _____



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11. Is it possible for individual IV-2 to be a carrier? _____ Why? _____

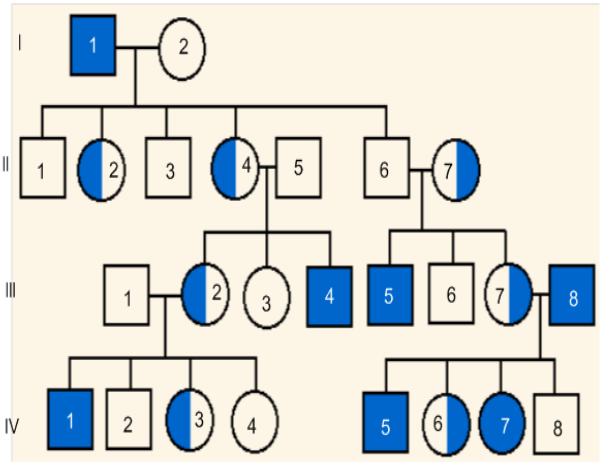
12. The pedigree to the right shows the passing on of colorblindness. What sex can ONLY be carriers of colorblindness? _____

13. With this in mind, what kind trait is colorblindness? _____

14. Why does individual IV-7 have colorblindness? _____

15. Why do all the daughters in generation II carry the colorblind gene? _____

16. Name 2 IV generation colorblind males. _____



Use Figure A to answer the questions below. **Hemophilia – Darkened Normal- Clear**

1. Number all individuals on the pedigree at the top of each shape.
2. *How many males are there?* _____
3. *How many males have hemophilia?* _____
4. *How many female are there?* _____
5. *How many females have hemophilia?* _____
6. How many marriages are there? _____
7. *How many children did the first couple (couple in row I) have?*_____
8. *How many children did the third couple (couple in row III) have?* _____
9. *How many generations are there?* _____
10. *How many members are there in the fourth generation?* _____

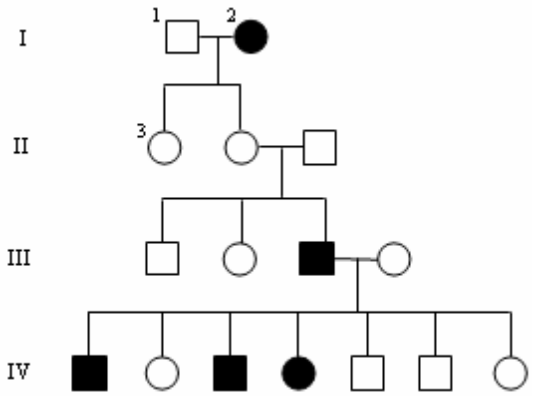


Figure A

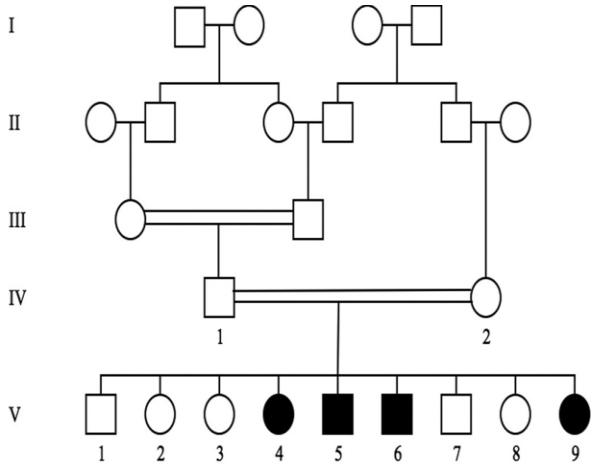
11. The genotypes of the males in a pedigree for sex-linked inheritance are easy to determine since normal blood clotting (N) is dominant and hemophilia is recessive (n). Since these alleles are on the X chromosome only, a male represented by a clear square will have the genotype XNY. A darkened square will be XnY. Label *under* each individual on the pedigree.
    a. *What is the genotype for Individual #1?* _____ *Phenotype?* _____
    b. *What is the genotype for Individual #10?* _____ *Phenotype?* _____
    c. *What is the genotype for the first born male in generation III?* _____ *Phenotype?* _____

12. Females with hemophilia have an easy genotype to identify. They are all XnXn. Both recessive alleles must be present for a female to have hemophilia. If one dominant allele is present (XN), the individual would be normal for clotting.
    a. How many females have the genotype XnXn? _____

13. Females who do not show the trait for hemophilia may be homozygous dominant (XNXN) or heterozygous (XNXn). A heterozygous female is called a carrier. Examination of offspring can often determine which genotype the parents have. If any child (son or daughter) has hemophilia, then the female must be heterozygous. If her son has hemophilia, he has genotype XnY. He inherited the Y from the father, so the other allele is his genotype (Xn) had to come from the mother. If a daughter has hemophilia (XnXn), she inherited an Xn from each parent, thus making the genotype for the normal mother XNXn.
    a. What would be the genotype for the female who marries into the family in generation III? _____

Use the pedigree to the right to answer the following questions:
It will help if you number the individuals in each generation to start with.

1. How are III-1 and II-4 related? _____
2. How are V-3 and II-5 related? _____
3. How are IV-1 and IV-2 related? _____
4. Why do we see clear boxes through generation IV and then have shaded boxes in generation V? _____
    _____
    _____
5. How are V-9 and I-3 related? _____
6. How are II-1 and II-3 related? _____
7. How are III-2 and IV-2 related? _____
8. How are III-2 and II-4 related? _____
9. How are IV-1 and II-2 related? _____



Use the information provided below to create a pedigree. (you may need additional paper)

1. Draw a pedigree to depict the following family. One couple has a son and a daughter with normal pigmentation. Another couple has one son and two daughters with normal pigmentation. The daughter from the first couple has three children with the son of the second couple. Their son and one daughter have albinism; their other daughter is normal. Color in children with albinism and give the genotypes of all people.

2. A man and woman marry. They have five children, 2 girls and 3 boys. The mother is a carrier of hemophilia, an X-linked disorder. She passes the gene on to two of the boys who died in childhood and one of the daughters is also a carrier. Both daughters marry men without hemophilia and have 3 children (2 boys and a girl). The carrier daughter has one son with hemophilia. One of the non-carrier daughter's sons marries a woman who is a carrier and they have twin daughters. What is the percent chance that each daughter will also be a carrier?

3. The great-great maternal grandmother of a boy was a carrier for color-blindness, an X-linked disorder. His great uncle on his mother's side was colorblind but this great uncle's father was unaffected. The boy's mother has 2 brothers (1 colorblind, 1 unaffected) and 1 sister (unaffected). The boy's grandmother on his mother's side had 1 brother who was colorblind and 3 sisters. Two of these sisters were unaffected and one was a carrier. The boy's great grandmother on his mother's side had 4 sisters. The boy has one unaffected sister and he is colorblind. What is the probability of the boy's sons being colorblind if he marries a non-carrier?

4. An unaffected man marries a woman who is a carrier for Duchenne Muscular Dystrophy, which is attributed to an X-linked gene. They have four children, one with Duchenne, one carrier daughter and a daughter and son who are unaffected. The child with Duchenne Muscular Dystrophy dies in childhood. The carrier daughter marries and has three children of her own, two of which are carriers and one of which is unaffected. What is the most likely sex of these two carrier children given the fact that they are unaffected by the X-linked gene?

5. On the soap opera, The young and the restless, several individuals suffer from a rapid again syndrome in which a young child is set off to boarding school and returns three months later an angry teenager.; Victims have been known to age up to two decades in variations of the disorder. In the newman family, siblings Nicholas and Vicoria aged from six to eighteen in a few months. Their parents, Victor and Nikki are not affected. In fact they don't seem to age at all. Although, Victors mother and Nikki's father, the children's grandparents, both had the aging disorder.
    a. What mode of interitance (dominant, recessive, sex linked) is the rapid aging disorder?
    b. Draw a pedigree to depict the Newman family.

PEDIGREE NOTES