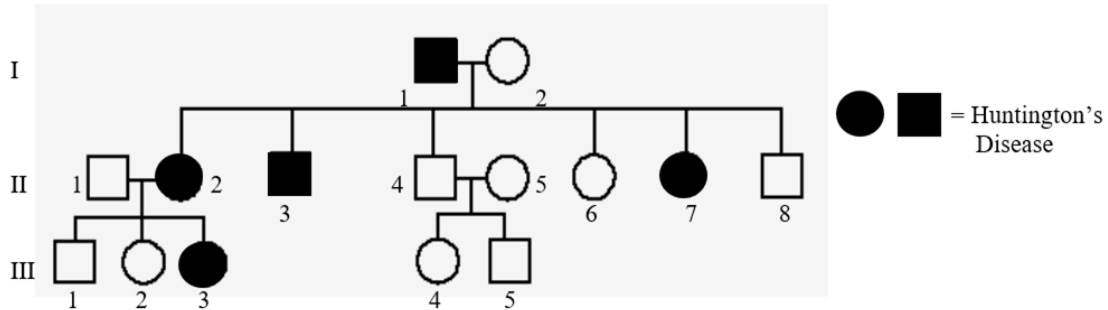


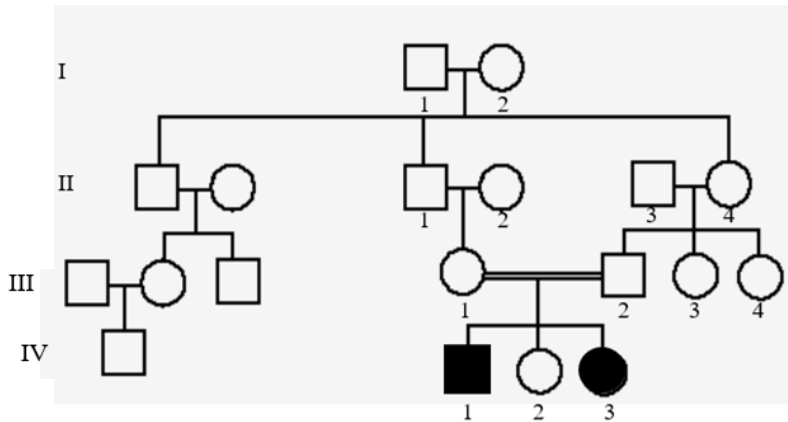
# Genetics Problems #6

## Pedigrees - Going Beyond the Family Tree

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Block: \_\_\_\_\_



- Which members of the family to the right are **afflicted** with Huntington's Disease? \_\_\_\_\_
- There are no carriers for Huntington's Disease-you either have it or you don't. With this in mind, is Huntington's disease caused by a dominant or recessive trait? \_\_\_\_\_
- How many children did individuals I-1 and I-2? \_\_\_\_\_
- How many girls did II-1 and II-2 have? \_\_\_\_\_ How many have Huntington's Disease? \_\_\_\_\_
- How are individuals III-2 and II-4 related? \_\_\_\_\_ I-2 and III-5? \_\_\_\_\_



- The figure to the left shows a family's pedigree for Hitchhiker's Thumb. Is this trait dominant or recessive? \_\_\_\_\_

- How do you know? \_\_\_\_\_

- How are individuals III-1 and III-2 related? \_\_\_\_\_

**AWE!** \_\_\_\_\_

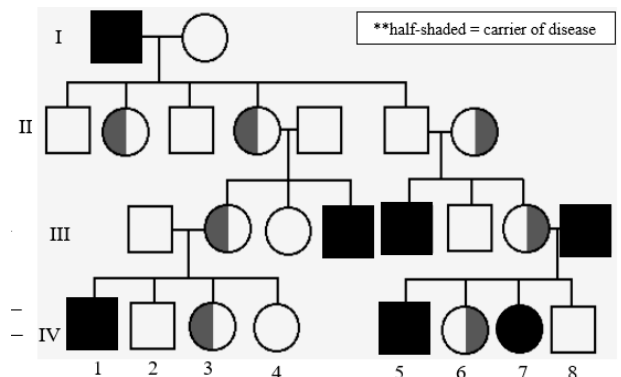
- How would you name the 2 individuals that have hitchhiker's thumb? \_\_\_\_\_
- Name two individuals you know to be carriers or hitchhiker's thumb. \_\_\_\_\_
- Is it possible for individual IV-2 to be a carrier? \_\_\_\_\_ Why? \_\_\_\_\_

- The figure to the right shows a family's pedigree for colorblindness. Which sex can be carriers of colorblindness and not have it? \_\_\_\_\_

- With this in mind, what kind of trait is colorblindness? \_\_\_\_\_

- Why does individual IV-7 have colorblindness? \_\_\_\_\_

- Why do all the daughters in generation II carry the colorblind gene? \_\_\_\_\_



A pedigree is a chart of a person's ancestors that is used to analyze genetic inheritance of certain traits – especially diseases. The symbols used for a pedigree are:

○ female, unaffected

● female, affected

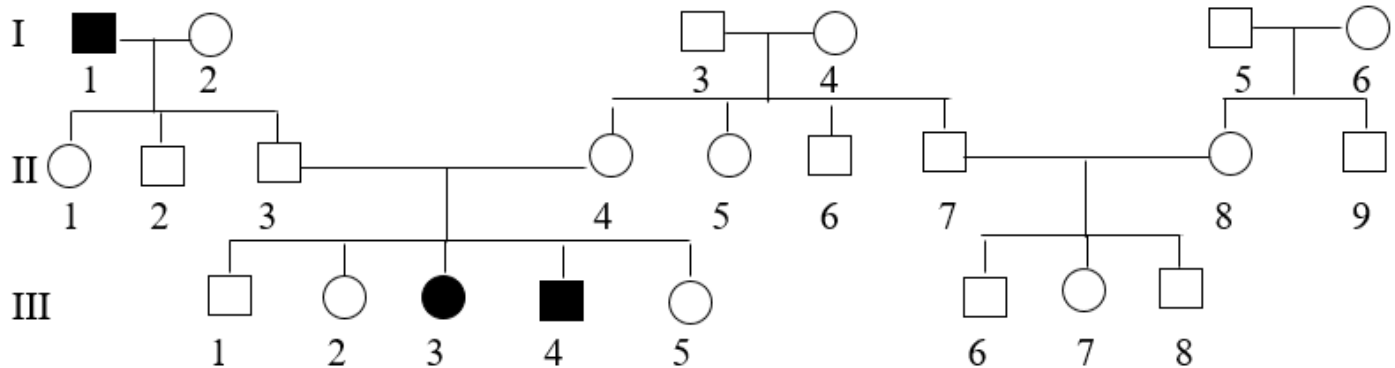
□ male, unaffected

■ male, affected

○ Siblings are placed in birth order from left to right and are labeled with numbers.

○ Each generation is labeled with a roman numeral.

○ Example: we would name an individual II-3 if he/she was in the second generation and the 3<sup>rd</sup> child born.



16. Try to identify the genotypes of the following individuals using the pedigree above. ( **Use the terms: Homozygous dominant, Homozygous recessive, Heterozygous**).

▪ III-3: \_\_\_\_\_

▪ I-1: \_\_\_\_\_

▪ II-1: \_\_\_\_\_

▪ II-4: \_\_\_\_\_

17. Is this trait dominant or recessive? ***In complete sentences, explain your answer.*** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

18. How can you know for sure that individuals II-3 and II-4 are heterozygous? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

19. **Make your own pedigree:** Brown eyes are a dominant eye-color allele and blue eyes are recessive. A brown-eyed woman whose father had blue eyes and whose mother had brown eyes marries a brown-eyed man whose parents are also brown-eyed. They have a son who is blue-eyed. Please draw a pedigree showing all four grandparents, the two parents, and the son. Indicate which individuals you are certain of their genotype and where there are more than one possibilities.