Name _____Date _____ Period _____

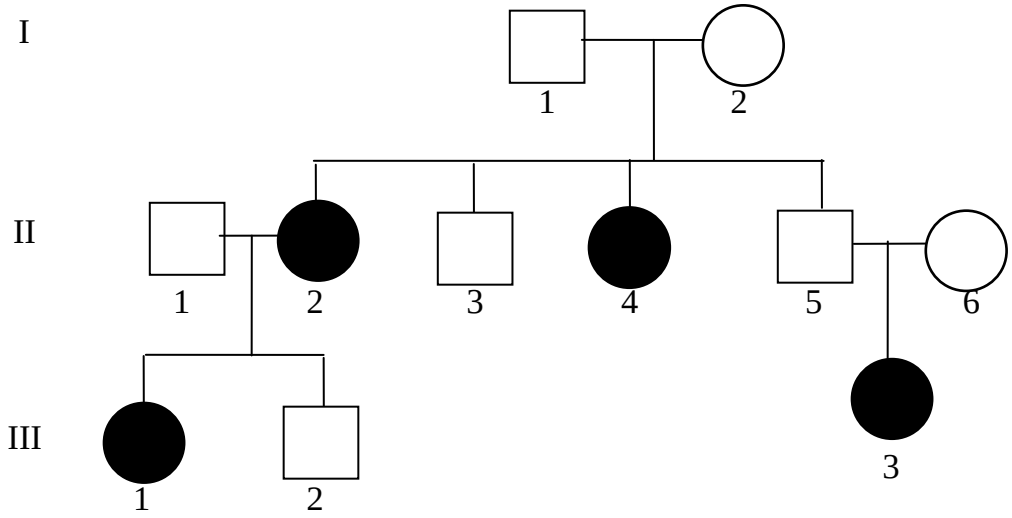
PEDIGREE PROBLEM SET

1. Make a pedigree for left-handedness using information of the Thomas family:

The father, Tom, and mother, Dana, have three children. The two oldest children are Anna and Mary and the youngest child is Teddy. The oldest daughter, Anna, is married and has an older son, Will, and younger daughter, Vanessa. Mary is also married and has a son, Patrick. Teddy is not yet married. Everyone in this family is right handed except the father, the oldest daughter, and the granddaughter. Right-handedness is dominant. Show the genotypes of each family member. If you don't know the full genotype, use a question mark for the unknown allele.

2. An individual with albinism lacks an enzyme needed to form the skin pigment melanin. This condition is controlled by a recessive allele. Use S to represent the allele for normal skin and s to represent the allele for albinism.

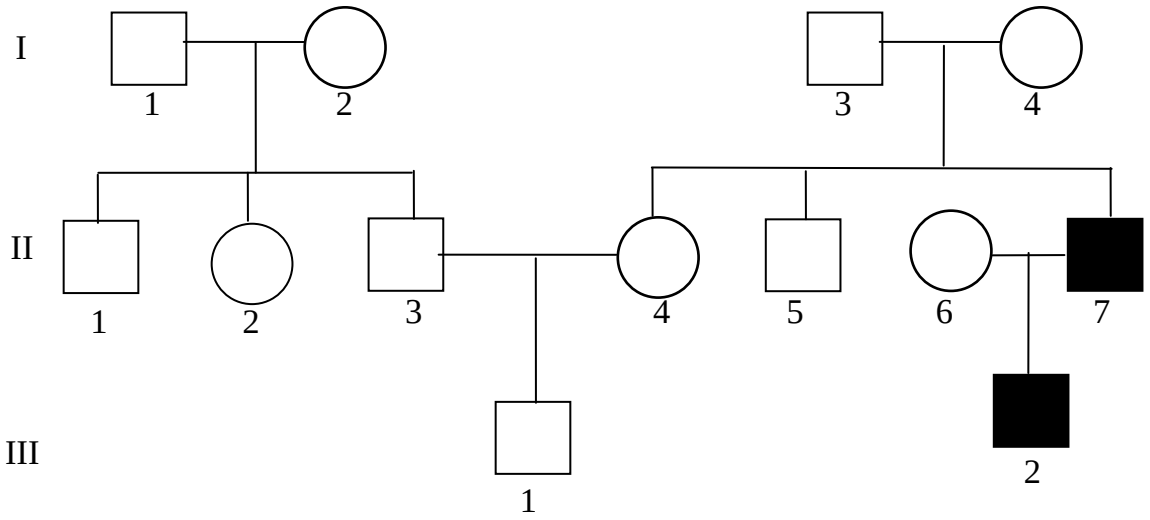
A. Fill in the genotypes below for each individual in the pedigree below.
B. If individuals 1 & 2 in generation II were to have another child, what is the probability that their next child will have normal skin pigment?



3. Hemophilia is a sex-linked genetic disease caused by recessive allele (X^h) which doesn't allow the blood to clot. Female hemophiliacs are homozygous recessive, but carrier females have only one allele and their blood clots normally.

A. In the pedigree below, list the genotypes of individuals 3 and 4 in the first generation, individuals 4-7 in the second generation, and both individuals in the third generation.

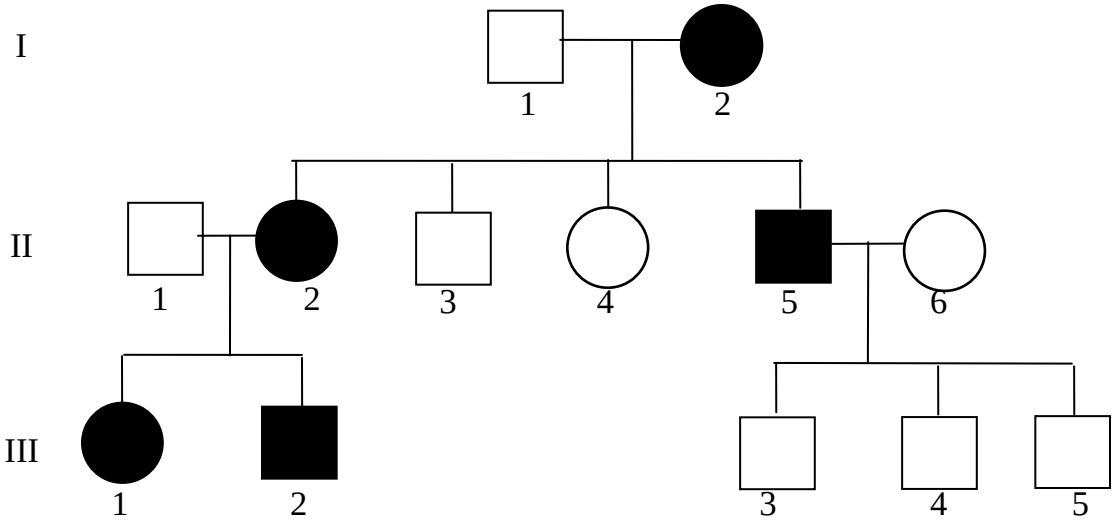
B. If individual 2 in generation III were to marry a woman that was homozygous for normal blood clotting (X^HX^H), what is the probability that their first child will be a hemophiliac?



4. Rickets in a condition in which the bones are soft. Children with rickets develop deformed bones. Rickets is caused by a dominant allele (R) on the X chromosome. The recessive allele (r) does not cause the disease.

A. Determine the genotypes for the individuals in the pedigree below.

B. If individual 1 in generation I had the same phenotype as his wife, what are the chances that each of their children would have rickets?



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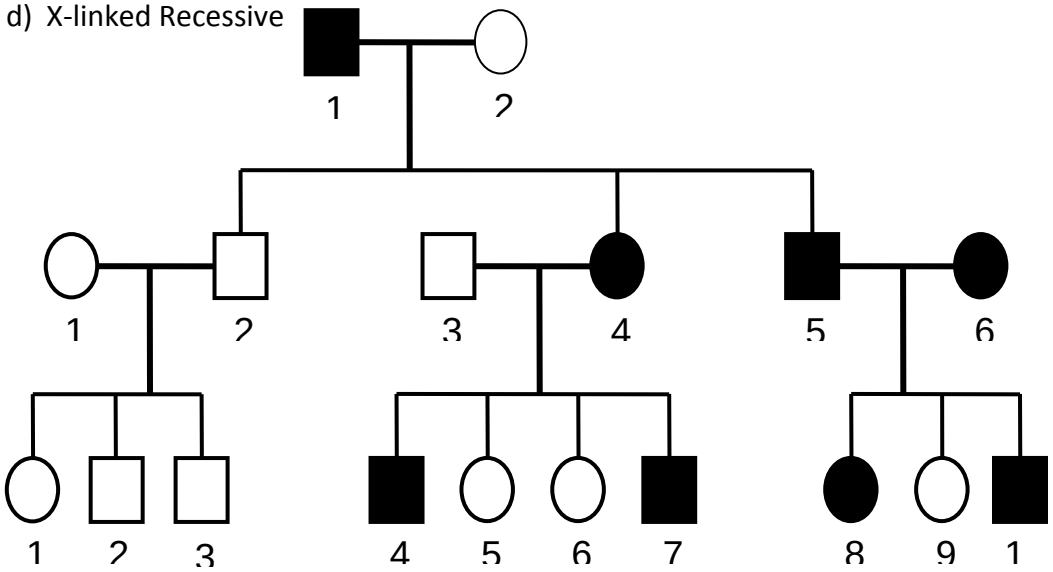
For questions 5 and 6, draw a pedigree (including genotypes) for the following scenarios and answer the questions.

5. A woman's sister has cystic fibrosis, a disease caused by recessive genes. Neither of her parents has the disease. What chance is there that her mother is a carrier (heterozygous) for the trait? What chance is there that the woman herself is a carrier for the trait?

6. Huntington's disease is a degenerative disease of the nervous system. It is caused by a dominant allele. John's father, who is heterozygous for the disease-causing allele, just began to show the symptoms. What is the chance that John will have the disease?

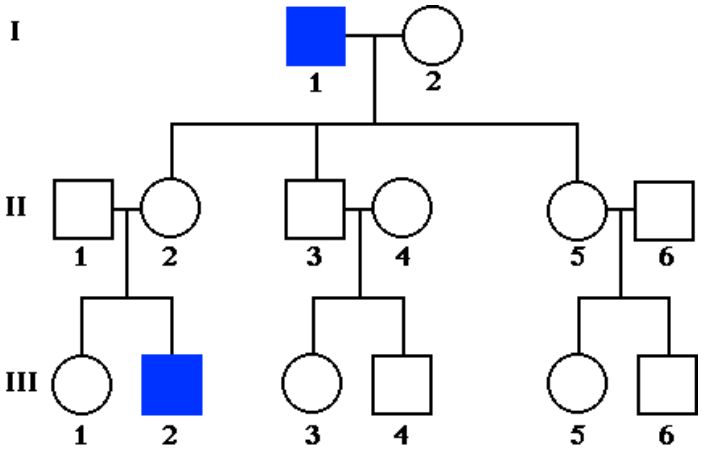
7. What type of inheritance does the pedigree below show?

a) Autosomal Dominant
b) Autosomal Recessive
c) X-linked Dominant
d) X-linked Recessive



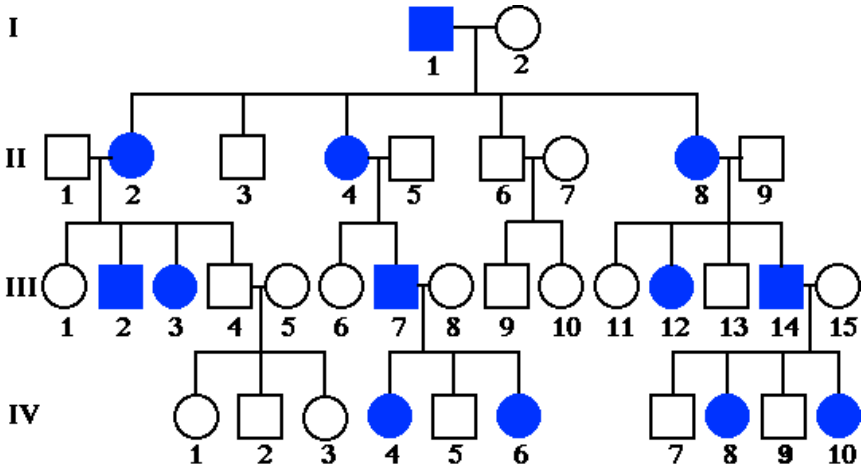
8. What type of inheritance does the pedigree below show?

a) Autosomal Dominant
b) Autosomal Recessive
c) X-linked Dominant
d) X-linked Recessive



9. What type of inheritance does the pedigree below show?

a) Autosomal Dominant
b) Autosomal Recessive
c) X-linked Dominant
d) X-linked Recessive



10. What type of inheritance does the pedigree below show?

a) Autosomal Dominant
b) Autosomal Recessive
c) X-linked Dominant
d) X-linked Recessive