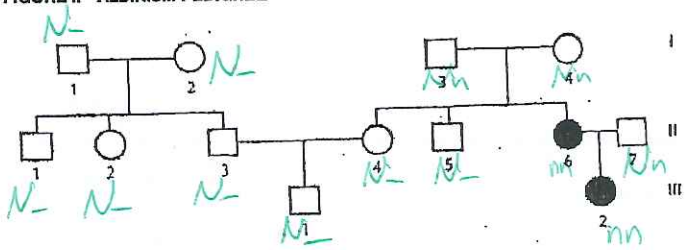
Name Key

Part II - Pedigree Analysis

1. Individuals who lack an enzyme needed to form the skin pigment melanin are called albinos. Normal skin pigmentation id dominant. Use N to represent the gene for normal and nn to represent the genotype for albinism. If you cannot determine if the dominant trait is heterozygous or homozygous, use N_. Refer to **FIGURE II** and identify the genotype of each individual. **Draw a chart listing the individuals and their genotypes.** Or label them on the diagram

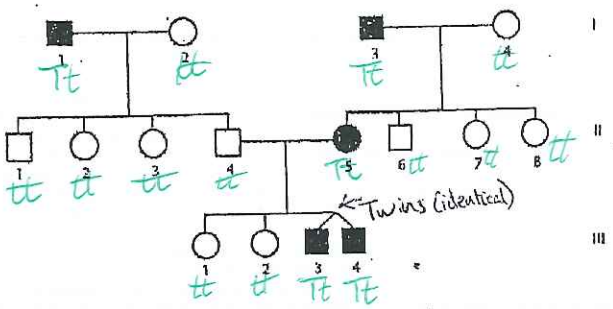
FIGURE II - ALBINISM PEDIGREE



Q4 - How many individuals had the genotype Nn ? How many were N_?
Q5 - Using a Punnet square predict the probability of the grandparents having albino children.

2. The following pedigree demonstrates the ability to taste PTC paper. The ability to taste is a dominant trait and is represented by the letter **T**. Nontasters are represented by tt and uncertain genotypes as T_. Refer to **FIGURE III** and identify the genotypes as you did in the previous pedigree.

Figure III - PTC Tasting Pedigree



Q6 - How many individuals are heterozygous? How many are homozygous ? 5
Q7 - What is the probability of grandparents 3 and 4 having nontaster offspring ?

50%

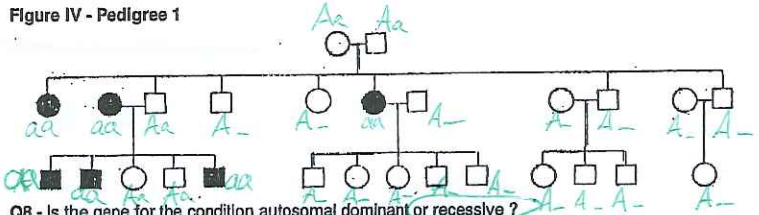
Part III - Trait Analysis

1. The following pedigrees will be used to determine whether the trait is ~~autosomal~~ dominant or autosomal recessive. In tracing ~~autosomal~~ alleles, if both parents have the disorder and the offspring do not, the condition is [redacted] dominant. If neither parent shows the disorder but some of their children do, the condition is [redacted] recessive. A carrier is an individual who appears to be normal, but who is capable of passing on a gene for the disorder. If the characteristic is dominant, there can be no carriers because only a single gene is needed to show the disorder. **Table II** provides some keys for your answers.

Table II - Pedigree Keys

CHARACTERISTIC	KEY
AUTOSOMAL DOMINANT	AA = AFFECTED Aa = AFFECTED aa = NORMAL
AUTOSOMAL RECESSIVE	AA = NORMAL Aa = CARRIER aa = AFFECTED

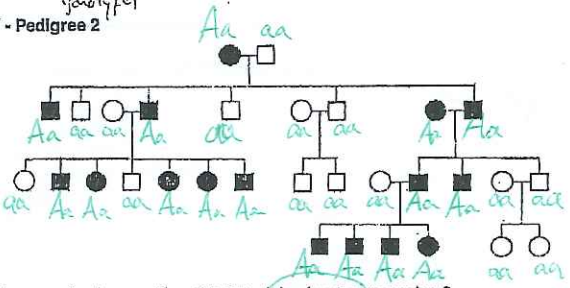
Figure IV - Pedigree 1



Q8 - Is the gene for the condition autosomal dominant or recessive ?
Q9 - Identify the pedigree for each individual using the above table. Use A_ if undetermined.

genotypes

Figure V - Pedigree 2



Q10 - Is the gene for the condition ~~autosomal~~ dominant or recessive ?
Q11 - Identify the pedigree for each individual using the above table. Use A_ if undetermined.

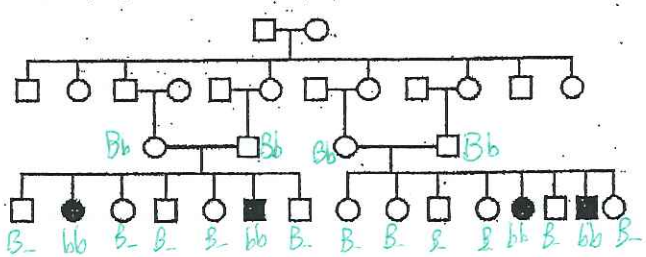
Part IV - The Blue People Of Troublesome Creek

Six generations after a French orphan named Martin Fugate settled on the banks of eastern Kentucky's Troublesome Creek with his redheaded American bride, his great-great-great great grandson was born in a modern hospital not far from where the creek still runs. The boy inherited his father's lankiness and his mother's slightly nasal way of speaking. What he got from Martin Fugate was dark blue skin. "It was almost purple," his father recalls.

Doctors were so astonished by the color of Benjy Stacy's skin that they raced him by ambulance from the maternity ward in the hospital near Hazard to a medical clinic in Lexington. Two days of tests produced no explanation for skin the color of a bruised plum. A transfusion was being prepared when Benjy's grandmother spoke up. "Have you ever heard of the blue Fugates of Troublesome Creek?" she asked the doctors. "My grandmother Luna on my dad's side was a blue Fugate. It was real bad in her," Alva Stacy, the boy's father, explained. "The doctors finally came to the conclusion that Benjy's color was due to blood inherited from generations back."

Benjy lost his blue tint within a few weeks, and now he is about as normal looking a seven-year-old boy as you could hope to find. His lips and fingernails still turn a shade of purple-blue when he gets cold or angry a quirk that so intrigued medical students after Benjy's birth that they would crowd around the baby and try to make him cry. "Benjy was a pretty big item in the hospital," his mother says with a grin.
Dark blue lips and fingernails are the only traces of Martin Fugate's legacy left in the boy; that, and the recessive gene that has shaded many of the Fugates and their kin blue for the past 162 years.

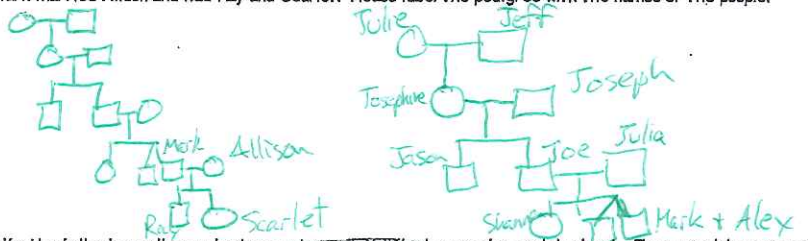
Given below is a pedigree of some of the blue people of Troublesome Creek



(A) The blue trait is inherited as an autosomal recessive trait which means that affected individuals have 2 copies of a mutant gene.
(B) Indicate which individuals are carriers of the "blue" gene by placing the letters Bb next to their symbol.
(C) What is the relationship of the parents of the "blue" children? Cousins
(D) What is the probability that the unaffected siblings of the "blue" children are carriers for the "blue" trait? 50% (or 66%)
(E) What warning does marrying close relatives does this illustrate?

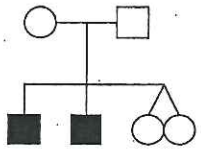
4. Draw a pedigree that represents Mary married to Greg, with 2 sons and 1 daughter. Their son, Scott, married April and had Sutton (a boy) and Kendall (a girl). Their daughter, Karen, married Harry and had Eliq (a son) and Tariq (a son). Please label the pedigree with the names of the people.

5. Draw a pedigree that represents Julie married to Jeff, with one daughter, Josephine. Josephine married Joseph and had Jason and Joe. Joe married Julia and had Shannon and fraternal twin boys, Mark and Alex. Mark married Allison and had Ray and Scarlet. Please label the pedigree with the names of the people.



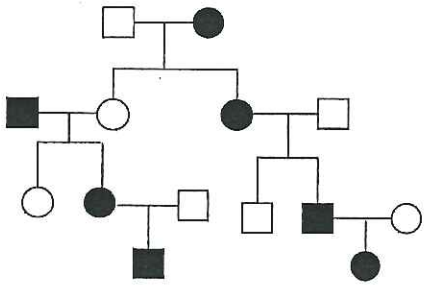
A. Identify the following pedigree charts as ~~autosomal, X-linked,~~ recessive, and dominant. Please explain your answer.
Label Genotypes with As

1. ~~Is the following autosomal or X-linked?~~ Is it dominant or recessive? Please explain.



Recessive. If the trait were Dominant, the mom + dad would be recessive, so none of the kids could be dominant.

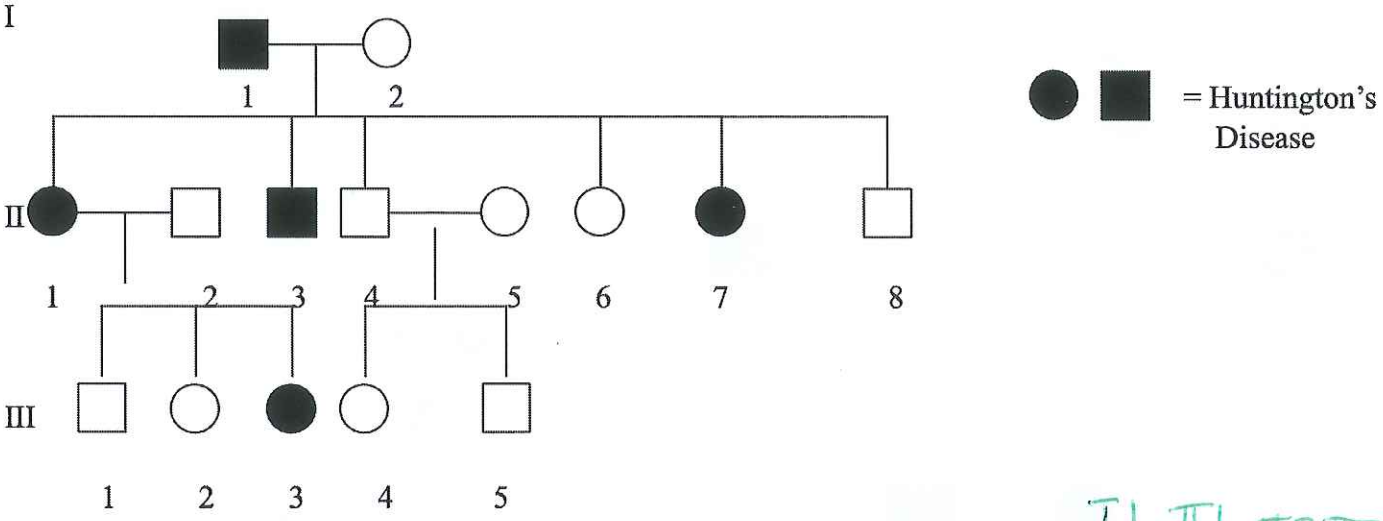
2. ~~Is the following autosomal or X-linked?~~ Is it dominant or recessive? Please explain.



You can't tell!

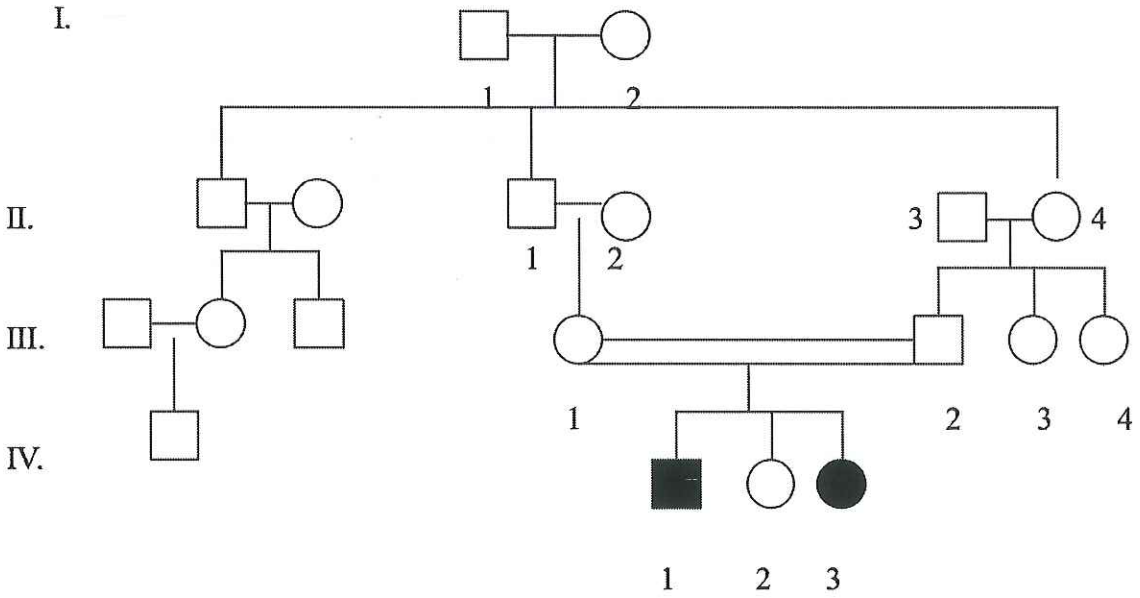
Pedigree Worksheet 2

Problem 1:



1. Which members of the family above are affected with Huntington's disease? I1, II1, II3, II7, and III3
2. There are no carriers for Huntington's disease, you either have it or you don't. Is Huntington's disease caused by a dominant or recessive trait? Dominant
3. How many children did individual's I-1 and I-2 have? 6
4. How many girls did II-1 and II-2 have? 2 How man have Huntington's disease? 1
5. How is individual III-2 and II-4 related? Uncle/niece I-2 and III-5? Grandma/grandson

Problem 2:



1. The pedigree above shows the passing of Hitchhiker's thumb in a family. Is this trait dominant or recessive? Recessive
2. How do you know? Mom + dad don't have it, but some kids do
3. How are individual's III-1 and III-2 related? Cousins
4. Name 2 individuals that have hitchhiker's thumb: IV 1, IV 3
5. Name 2 individuals that are carriers of hitchhiker's thumb: III 1, III 2

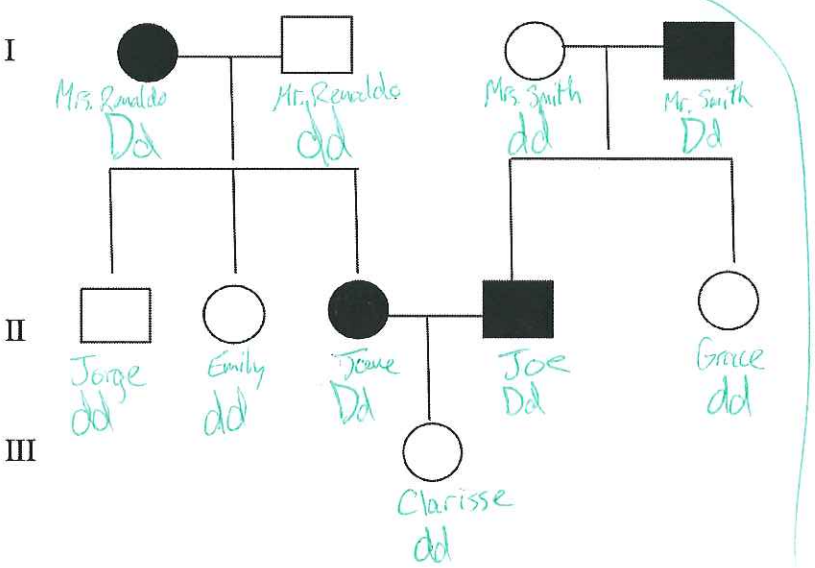
Problem 3:

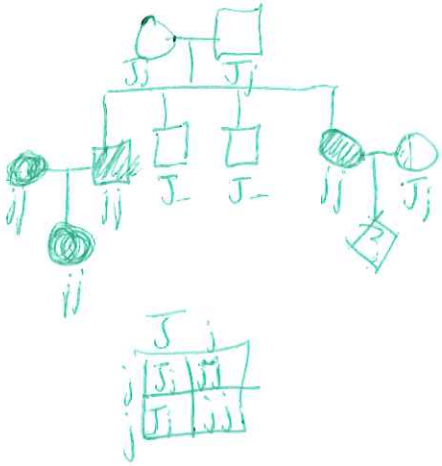
Do a pedigree for the following:

A. Joe marries Sue; they are carriers for the jumping disease. They have 4 kids: Jack, Zack, Luke, and Sara. Zack and Sara have the jumping disease (recessive). Jack marries Amy, she has the disease. They have Lorie, who is also affected. Sara marries Dan who is a carrier for the disease. Sara is pregnant.

B. What are the chances of Sara and Dan having a baby with the jumping disease? 50%

Problem 4:

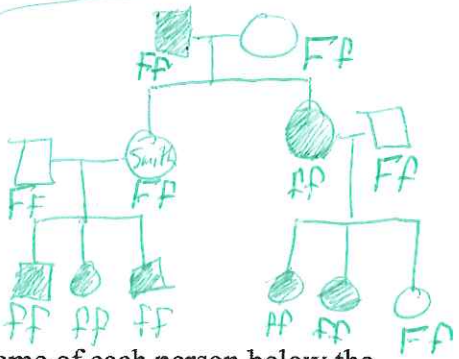




The following passage describes the family shown in the Pedigree above:

Although Jane and Joe Smith have dimples, daughter, Clarisse does not. Joe's dad has dimples, but his mother and his sister, Grace, do not. Jane's dad, Mr. Renaldo, her brother, Jorge, and her sister Emily, do not have dimples but her mother does.

1. Write the name of each person below the correct shape in the Pedigree above, along with **possible genotypes.**
2. How are marriage and offspring symbolized? horizontal connecting line
3. What do the Roman numerals symbolize? Generation



Problem 5:

Make a pedigree based on the following passage about freckles. Write the name of each person below the correct shape, along with **possible genotypes.**

Andy, Penny, and Gilbert have freckles, but their mother, Mrs. Smith does not. Mrs. Robles (Mrs. Smith's sister), has freckles, but only one of her parents, Mr. Garcia has freckles, Denise and Darline Robles are freckled, but their sister, Dixie, like her father is not freckled.