Name: _____ Date: _____ Period: ____

Genetics Practice Week #____

Directions: Answer all questions, showing work with a Punnett square when necessary.

Figure 1 shows a pedigree of individuals who are affected with nearsightedness (n), a recessive trait. Carriers of the trait are not shown.

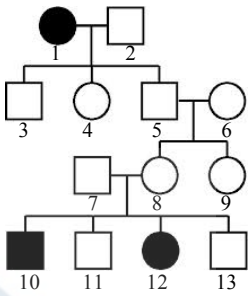

Figure 1

1. How many generations are shown? _____
2. How many individuals are affected? _____
3. Individual 2 is not a carrier.
    a. What are the genotypes of Individuals 3, 4, and 5?

    b. Label all carriers by half-shading in their shapes.
4. Given that Individuals 10 and 12 are both affected by nearsightedness, what are the genotypes of Individuals 7 and 8?

Figure 2 shows the dominant trait of 6 digits on each hand and foot (D). Individuals affected by the trait have at least one copy of the dominant allele. Affected individuals are shaded and carriers are not shown.

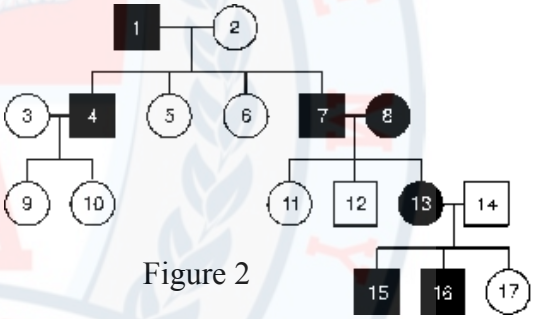

Figure 2

5. What is the genotype of Individual 4? _____
6. What is the genotype of Individual 5? _____
7. Individual 7 is heterozygous. What is the genotype of Individual 8 given that they have two children with the normal number of digits?

Figure 3 shows a pedigree of related individuals. Individual 1 is homozygous for A blood.

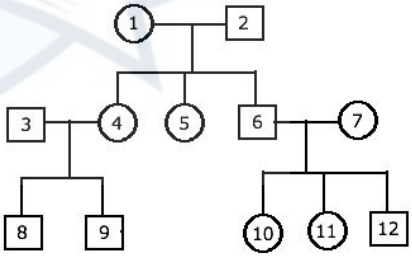

Figure 3

8. If Individuals 4, 5, and 6 are all AO, what is the genotype of Individual 2?

9. Individual 10 has type AB blood, Individual 11 has type B blood, and Individual 12 has type O blood. What is the genotype of Individual 7?

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Figure 4 shows individuals affected by cystic fibrosis (f), a recessive disease that affects the respiratory system. Carriers are not shown.

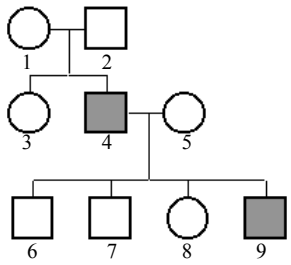


Figure 4

10. What is the genotype of Individual 1? _____
11. What is the genotype of Individual 2? _____
12. What is the probability that Individual 3 is a carrier?

13. Since Individual 9 is ff, what is the genotype of Individual 5? _____

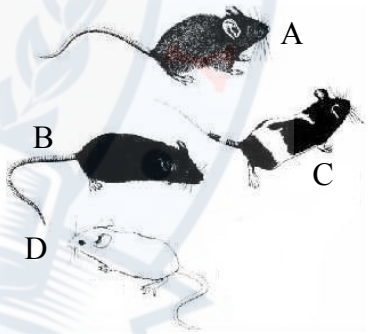
Codominant traits, like blood, have two or more dominant alleles, causing both phenotypes to show. For example, both A and B alleles are dominant, so the AB genotype causes A and B antigens to be produced. In **incomplete dominance**, however, have alleles that are not dominant over one another. For example, the Four O'clock flower plant exhibits incomplete dominance (Figure 5). The genotype RR produces a red flower, Rr produces a pink flower, and rr produces a white flower. Thus the heterozygous genotype results in a blend of the two homozygous phenotypes.

RR Rr rr

Figure 5

14. If you crossed two heterozygous Four O'clock flower plants, what are the probabilities of each phenotype?

Figure 6 shows several mice of different colors. Mouse A is grey, mouse B is black, mouse C is piebald, and mouse D is white.



15. If mouse A is one of the offspring, which mice are its parents?

16. Is this incomplete dominance or codominance? Why?

17. If mouse C is an offspring of mouse B and mouse D, does mouse C exhibit incomplete dominance or codominance? Why?

Figure 6

Given each genotype, label each as incomplete dominance or codominance.

TT tt Tt

Ee

Bb

18. _____ 19. _____ 20. _____