Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Homework Assignment #4 – Genetics (5 pts)**

A section of DNA that codes or a protein is known as a \_\_\_\_\_\_\_\_\_\_\_\_. Different versions of a gene are called \_\_\_\_\_\_\_\_\_\_\_\_. Humans have \_\_\_\_ pairs of chromosomes giving every person two copies of each gene. If both chromosomes have the same dominant allele then the person is considered \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, whereas if the person has different alleles on each chromosome then they are considered \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. If a person has two of the same recessive alleles then they are considered \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A man and woman who each have a parent with sickle-cell anemia but do not have the disorder themselves, want to have children. Sickle-cell anemia is an autosomal recessive disorder.

What is the woman’s genotype? \_\_\_\_\_\_\_\_\_\_\_\_\_

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What are the chances of the man and wife having a child with sickle-cell anemia? \_\_\_\_\_\_\_\_\_\_\_

Perform a cross between a man with polydactyly whose mother did not suffer from polydactyly, and a woman who does not suffer from polydactyly. Polydactyly is an autosomal dominant disorder.

What is the man’s genotype? \_\_\_\_\_\_\_\_\_\_\_\_\_

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What are the chances that the man and woman will have a child with polydactyly? \_\_\_\_\_\_\_

A woman named Betsy, who has hemophilia, wants to have children with Frank, who does not suffer from hemophilia. Hemophilia is an x-linked recessive disorder. What are the chances that Frank and Betsy will have a child who is male and has hemophilia? \_\_\_\_\_\_. Frank and Betsy’s son Charlie wants to have children with his wife Sharon who is a carrier for hemophilia. What are the chances that Charlie and Sharon will have a child with hemophilia?

What is Betsy’s genotype? \_\_\_\_\_\_\_\_\_ What is Charlie’s genotype? \_\_\_\_\_\_\_\_\_\_

Perform a cross between the Betsy and Frank. Perform a cross between Charlie and Sharon.

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In dogs, which are far superior to cats, black fur (B) is dominant to white fur (b), and long tails (T) are dominant to short tails (t). Perform a dihybrid cross between two dogs that are heterozygous for both traits.

What is the genotype of each dog described above? \_\_\_\_\_\_\_\_\_\_

What are the possibly gametes for each dog describe above? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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 Write out the phenotypic ratio for the

 dihybrid cross described above.

In the pedigree shown below, the solid circles and squares represent family members with cystic fibrosis. Cystic fibrosis in an autosomal recessive disorder that is represented by the letter c. Write the genotype for the family members represented by the following letters in the space provided.

A \_\_\_\_\_\_ B \_\_\_\_\_\_ C \_\_\_\_\_\_ D \_\_\_\_\_\_ E \_\_\_\_\_\_ F \_\_\_\_\_\_ G \_\_\_\_\_\_

