

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Per: \_\_\_\_\_

### Pedigree Practice Problems

1. A man and woman marry. They have five children, 2 girls and 3 boys. The mother is a carrier of hemophilia, an X-linked disorder. She passes the gene on to two of the boys who died in childhood and one of the daughters is also a carrier. Both daughters marry men without hemophilia and have 3 children (2 boys and a girl).
    - a. Create a pedigree for the family described above. (Be sure to shade individuals affected with hemophilia)
    - b. Determine the genotypes of the family members. List the genotypes on your pedigree.
    - c. What is the chance the carrier daughter will have a son with hemophilia? Show your work using a punnet square.
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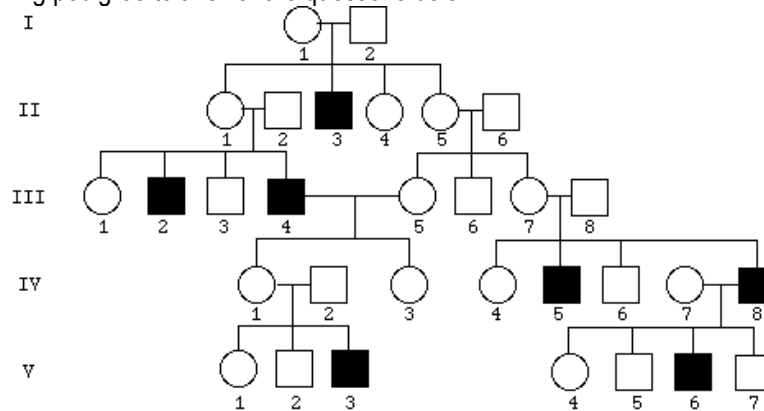
2. An unaffected man marries a woman who is a carrier for Duchenne Muscular Dystrophy, which is attributed to an X-linked gene. They have four children, one son with Duchenne, one carrier daughter and a daughter and son who are unaffected. The child with Duchenne Muscular Dystrophy dies in childhood. The carrier daughter marries and has three children of her own, two of which are carriers and one son that is unaffected.
    - a. Create a pedigree for the family described above. (Be sure to shade individuals affected with Duchenne Muscular Dystrophy)
    - b. Determine the genotypes of the family members. List the genotypes on your pedigree.
    - c. What is the most likely sex of these two carrier children given the fact that they are unaffected by the X-linked gene?
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3. A man and a woman are preparing to have a child. The man finds out that his father has Huntington's disease. Huntington's disease is an autosomal dominant disorder. The man's mother does not have Huntington's disease. The man has a sister who does not have Huntington's disease.
    - a. Create a pedigree for the family described above. (Be sure to shade individuals affected with Huntington's disease)
    - b. Determine the genotypes of the family members. List the genotypes on your pedigree.
    - c. What is the probability that the male has Huntington's disease?
    - d. If the man has Huntington's disease what is the chance he will pass the disorder to his child? The mother of the child is unaffected. Show your work using a punnet square.
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4. The ability to role your tongue is a dominant trait. A couple has three daughters. Two of the girls can roll their tongues and one girl cannot.
  - a. Create a pedigree for the family described above. (Be sure to shade individuals who can roll their tongue.)
  - b. Determine the genotypes of the family members. List the genotypes on your pedigree.
  - c. Determine the potential genotypes of the parents.
  - d. What information do you need to determine the genotypes of the parents?

5. Cystic Fibrosis is an autosomal recessive disorder that results in abnormal amounts of body secretions, such as mucous. A couple has a child with cystic fibrosis, and they have a child that is not affected by cystic fibrosis. The woman is pregnant with their third child.
- Create a pedigree for the family described above. (Be sure to shade individuals affected with Cystic Fibrosis)
  - Determine the genotypes of the family members. List the genotypes on your pedigree.
  - What is the probability the third child will have cystic fibrosis? Show your work using a punnet square.
  - If the affected daughter has a child with a man who is unaffected by cystic fibrosis (and there are no known cases of cystic fibrosis in his family) what is the chance their first child will have cystic fibrosis? Show your work using a punnet square.
  - If the unaffected daughter has a child that is affected with cystic fibrosis what can you conclude about her genotype and the father's genotype?
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6. Use the following pedigree to answer the questions below.



- Describe the inheritance of this trait.
- Determine the genotypes of the family members. List the genotypes on your pedigree.
- If individual IV-5 has a child with an unaffected woman what is the chance their child will have the disorder? Does the probability of inheriting the disorder change if they have a boy or a girl? Show your work using a punnet square.