

Name \_\_\_\_\_

Date \_\_\_\_\_

### Sex-Linked Traits Practice

1. Colorblindness is a sex-linked recessive trait. (B = dominant and b = recessive)

- a. What is the **genotype** of a female who is homozygous dominant for this trait? \_\_\_\_\_
- b. What is the genotype of a **carrier** female? \_\_\_\_\_
- c. What is the genotype of a **colorblind** male? \_\_\_\_\_
- d. What is the genotype of **colorblind** female? \_\_\_\_\_
- e. What is the genotype of a male who is **not colorblind**? \_\_\_\_\_
- f. What is the genotype of a woman who is **not colorblind**? \_\_\_\_\_ or \_\_\_\_\_
- g. What is the **phenotype** of a person who is  $X^bX^b$ ? \_\_\_\_\_
- h. What is the **phenotype** of a person who is  $X^BX^b$ ? \_\_\_\_\_
- i. What is the **phenotype** of a person who is  $X^bY$ ? \_\_\_\_\_
- j. What is the **phenotype** of a person who is  $X^BX^B$ ? \_\_\_\_\_
- k. What is the **phenotype** of a person who is  $X^BY$ ? \_\_\_\_\_

2. If a **carrier female** and a male who is **not colorblind** have a **girl**, what are the chances that she will be colorblind? (make a punnett square).

Female Genotype:


Answer:

Male Genotype:

3. If a colorblind female and a male who is not colorblind have a **boy**, what are the chances that he will be colorblind? (make a punnett square)

Female Genotype:


Answer:

Male Genotype:

Use the information below to answer questions 4-6.

4. Hemophilia (h), a recessive blood disorder, is a sex-linked trait.

- Normal females have a genotype of \_\_\_\_\_
- "Carrier" females have a genotype of \_\_\_\_\_
- Normal males have a genotype of \_\_\_\_\_
- Affected males have a genotype of \_\_\_\_\_

5. A normal male marries a carrier female and has offspring. What is the chance of the child having hemophilia? (H = normal and h=hemophilia)

6. A man with hemophilia marries a normal (non-carrier) woman and has offspring. What is the chance of the child having hemophilia? Explain your response.

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### H.S.A. Multiple Choice Practice

1. What is the chance that parents will produce a child with XY chromosomes?

- A) 0%      c. 25%  
B) 50%     d. 100%

2. Red-green color blindness affects about 7.0% of the human male population. It affects approximately 0.4% of the human female population. These data suggest that red-green color blindness is a

- A) dominant trait carried on the Y chromosome  
B) dominant trait carried on the X chromosome  
C) recessive trait carried on the Y chromosome  
D) recessive trait carried on the X chromosome

3. Genes carried only on an X-chromosome are said to be:

- A) Hybrid                  C) Dominant  
B) Segregated          D) Sex-linked

4. Based on the pattern of inheritance known as sex linkage, if a male has hemophilia, how many genes for this trait are present in the sex chromosomes in each body cell?

- A) 1                  C) 2  
B) 3                  D) 4

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### H.S.A. Practice

**1. A genetic disorder is sex-linked and is caused by a recessive allele (e). The allele for the unaffected condition (E) is dominant. A woman who is a carrier of the disorder marries an unaffected man. The couple would like to have a child but they are concerned that their child will inherit the disorder.**

Genotype of female? \_\_\_\_\_

Genotype of Male? \_\_\_\_\_


A) What is the probability the child inherits the disorder? \_\_\_\_\_%

B) What is the probability the child will not inherit the recessive allele (e)? \_\_\_\_\_%

### **SEX-LINKED CHALLENGE PROBLEM:**

**3. Which parental pair will produce a colorblind female?**

- a) homozygous normal-vision mother and a colorblind father  
b) colorblind mother and normal-vision father  
c) heterozygous normal-vision mother and normal-vision father  
d) heterozygous normal-vision mother and colorblind father

**Explain your answer to the challenge problem:**