Sex-Linked Inheritance Practice Problems

Name:_____ Date: _____

Directions: Complete the punnett square for each problem and then answer the questions.

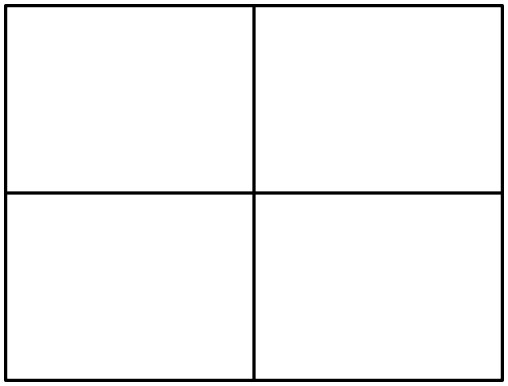
1. Colorblindness is a sexed linked trait. Colorblindness is recessive to normal color vision. A female carrier for colorblindness (X^CX^c) marries a male who is normal (X^CY). What is the percentage chance a male child will be color blind? What is the chance a female child being color blind?

a. *Write the genotypes for the parents:*

   Female: _____

   Male: _____

b. *Do the punnett square:*



c. *Answer the questions:*

   What is the percentage chance a male child will be color blind?

   What is the chance a female child being color blind?

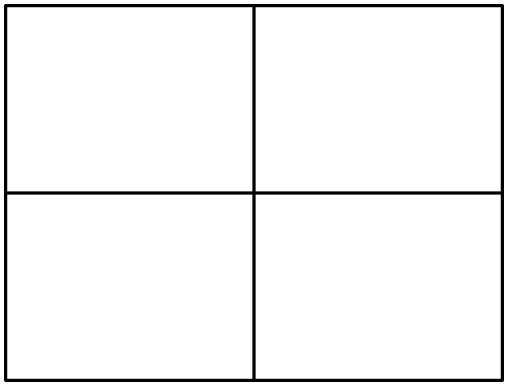
2. A male with colorblindness (X^cY) marries a colorblind woman (X^cX^c). If they have a baby, is there any chance their child will not be color blind? Why or why not?

a. *Write the genotypes for the parents:*

Female: _____

Male: _____

b. Do the punnett square:



c. Answer the questions:

Is there any chance their child will not be color blind? Why or why not?

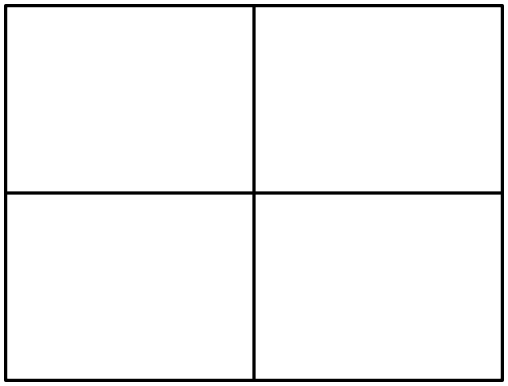
3. A normal male marries a colorblind woman and they decide to have a baby. Is there any chance their child will not be color blind? Why or why not?

a. Write the genotypes for the parents:

Female: _____

Male: _____

b. Do the punnett square:



c. Answer the questions:

Is there any chance their child will not be color blind? Why or why not?

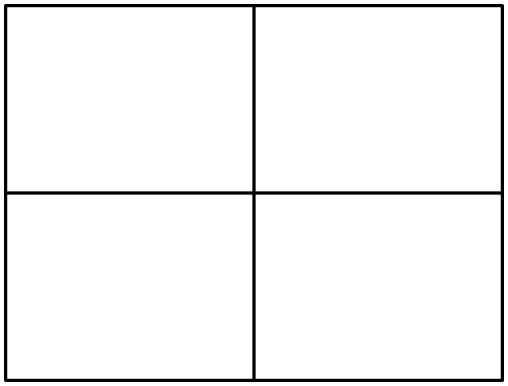
4. Hemophilia is a disease that causes blood not to clot. People can bleed to death from even a minor cut. Hemophilia is a sex linked recessive trait. A female carrier (X^HX^h) marries a normal male (X^HY). What are the chances their child will have hemophilia?

a. Write the genotypes for the parents:

Female: _____

Male: _____

b. Do the punnett square:



c. Answer the questions:

Is there any chance their child will have hemophilia? Why or why not?

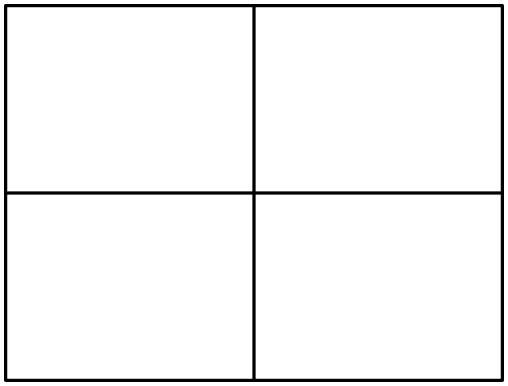
5. If a male has hemophilia (X^hY) and marries a homozygous dominant, normal female (X^HX^H) what percentage of the total offspring will have hemophilia?

a. Write the genotypes for the parents:

Female: _____

Male: _____

b. Do the punnett square:



c. Answer the questions:

What percentage of the total offspring will have hemophilia?

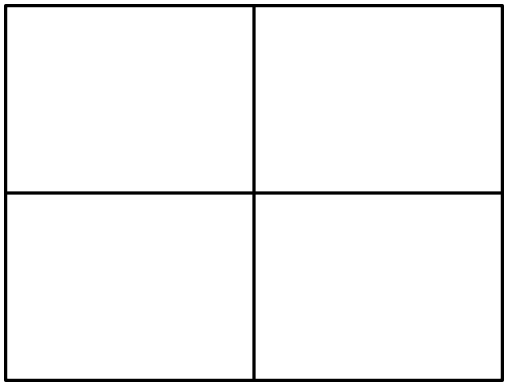
6. A normal male decides to have a baby with a carrier female. What percentage of their male offspring will have hemophilia?

a. Write the genotypes for the parents:

Female: _____

Male: _____

b. Do the punnett square:



c. Answer the questions:

What percentage of their male offspring will have hemophilia

7. Calico cats are a type of cat with yellow, white and black spotted fur. **The trait is both co-dominant and sex linked.**

Cats with X^YX^Y are yellow, Cats with X^BX^B, cats that are X^BX^Y are calico.

Because cats need both the yellow and black allele to be calico, *only female cats can be calico*, since only they get two X chromosomes. Male cats can only be black or yellow, since they only inherit one X chromosome.

A calico cat (X^BX^Y) has kittens with a back male (X^BY). What percentage of their offspring will be calico?

a. Write the genotypes for the parents:

Female: _____

Male: _____

b. Do the punnett square:

c. Answer the questions:

What percentage of their offspring will be calico?

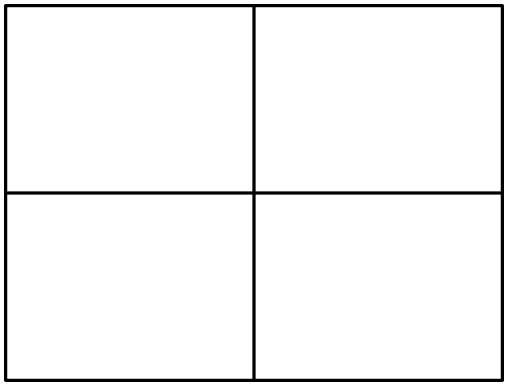
8. A female cat is black and has babies with a a yellow male cat. What percentage of their babies will be calico?

a. Write the genotypes for the parents:

Female: _____

Male: _____

b. Do the punnett square:



c. Answer the questions:

What percentage of their offspring will be calico?

9. If a person has a male cat with yellow fur, and wants to breed calico cats, what should the genotype of the female cat be? Use a punnett square to support your answer.