

Royal Family Pedigree

Name _____

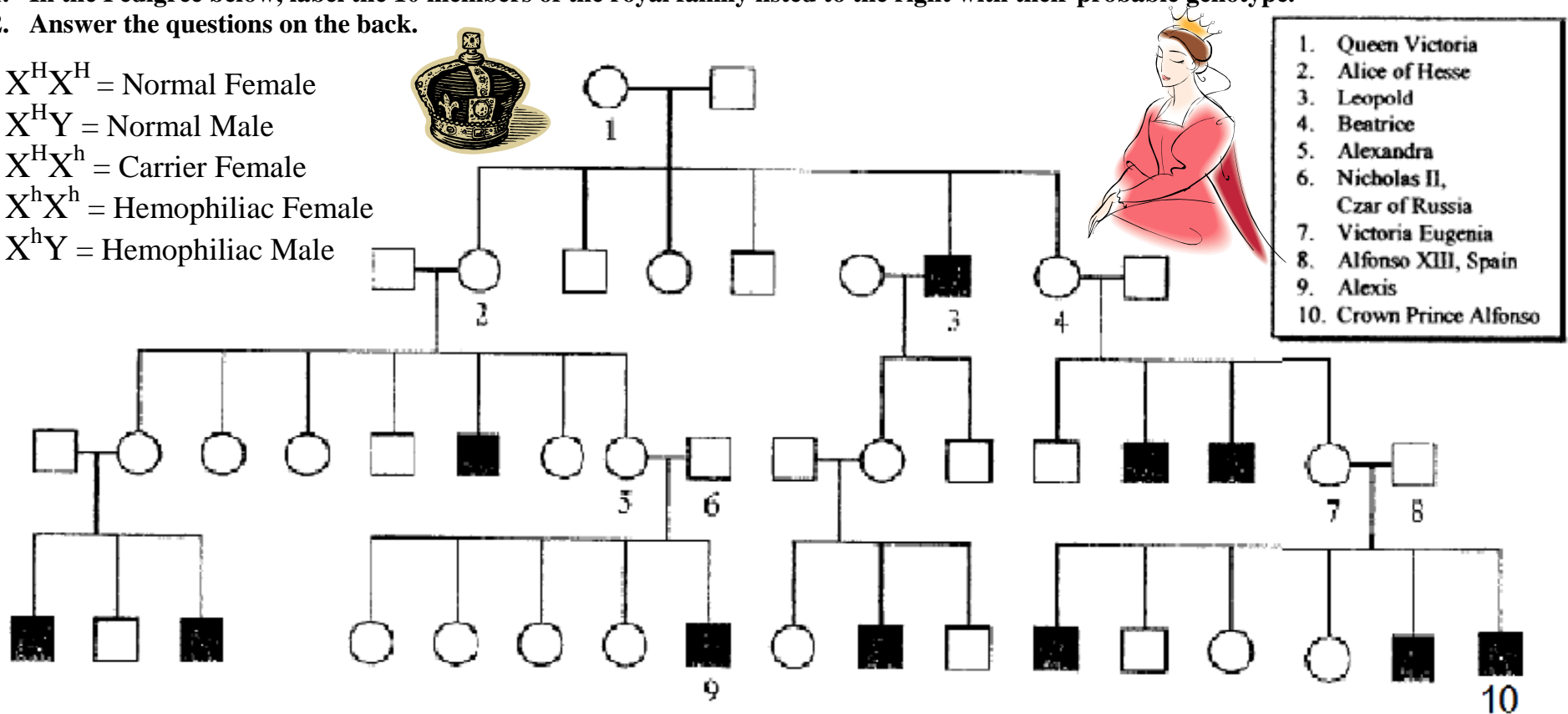
Sex-linked traits are interesting for a number of reasons. The inheritance pattern is unusual in that in humans sex-linked traits are almost exclusively found in males, yet the male always inherits the trait from his mother. Oddly, the male never passes the sex-linked trait on to his sons.

Consider also the following sex-linked trait that helped change the course of history. Below is a partial pedigree of Queen Victoria of England. It is thought that she was a carrier of hemophilia due possibly to a mutation on one of her X chromosomes. Queen Victoria's granddaughter, Alexandra (# 5 on the pedigree), married Nicholas II (#6), Czar of Russia. They had a son (#9) named Alexis, who inherited hemophilia.

Rasputin, a mystic holy man of Russia claimed to have supernatural powers. He said that his powers would enable him to control the bleeding disease of young Alexis. Czarina Alexandra had faith in Rasputin, and he soon became a great influence in Russia. He helped decide national policies, which hastened the Russian Revolution of 1917. An empire was lost to communism in part because of Alexis' inherited hemophilia.

1. In the Pedigree below, label the 10 members of the royal family listed to the right with their probable genotype.
2. Answer the questions on the back.

$X^H X^H$ = Normal Female
 $X^H Y$ = Normal Male
 $X^H X^h$ = Carrier Female
 $X^h X^h$ = Hemophiliac Female
 $X^h Y$ = Hemophiliac Male



Use the Royal Pedigree to answer the following questions.

1. From whom did Leopold inherit Hemophilia? _____

2. What was unusual about Leopold when compared to the other males with the disease?

3. What are the chances of Alice of Hess or Beatrice being carriers?

Alice _____ Beatrice _____

4. What were Leopold's chances of passing hemophilia down to his son? _____

5. What about his daughter? _____

What are the possible genotypes of the children of Leopold's daughter, a woman whose father was a hemophiliac and whose husband is normal?

6. Write the cross -

_____ x _____

7. Fill out the square -

Possible Children
