Genetics Review

1. In humans, brown eye color (B) is dominant to blue eye color (b). State the phenotypes for each of the following genotypes.

   (a) BB brown

   (b) Bb brown

   (c) bb blue

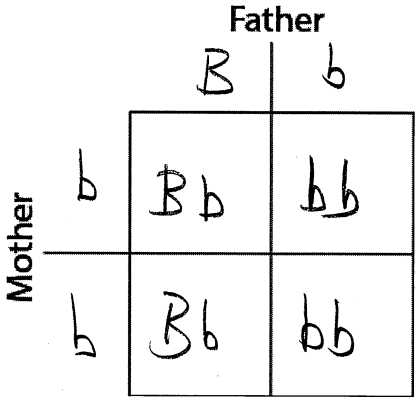
2. In horses, black coat color (B) is dominant to chestnut coat color (b). A heterozygous black coat male is mated with a chestnut coat female.

   (a) Indicate the genotype of the male and the female horses.

   (i) Male: Bb

   (ii) Female: bb

   (b) Complete the following Punnett square for the cross between these two horses.



   (c) What is the probability of a chestnut coat offspring?

   50%

3. In fruit flies, the gene for straight wings (S) is dominant to the gene for curly wings (s). Two heterozygous fruit flies are mated. What percent of the offspring would you expect to have curly wings?

	S	s
S	SS	Ss
s	Ss	ss

25%

4. Hemophilia is a recessive x-linked disorder. Show how it is possible for a normal father to have children that have hemophilia.

father: $X^H Y$

mother must have the recessive gene either a carrier or have hemophilia.

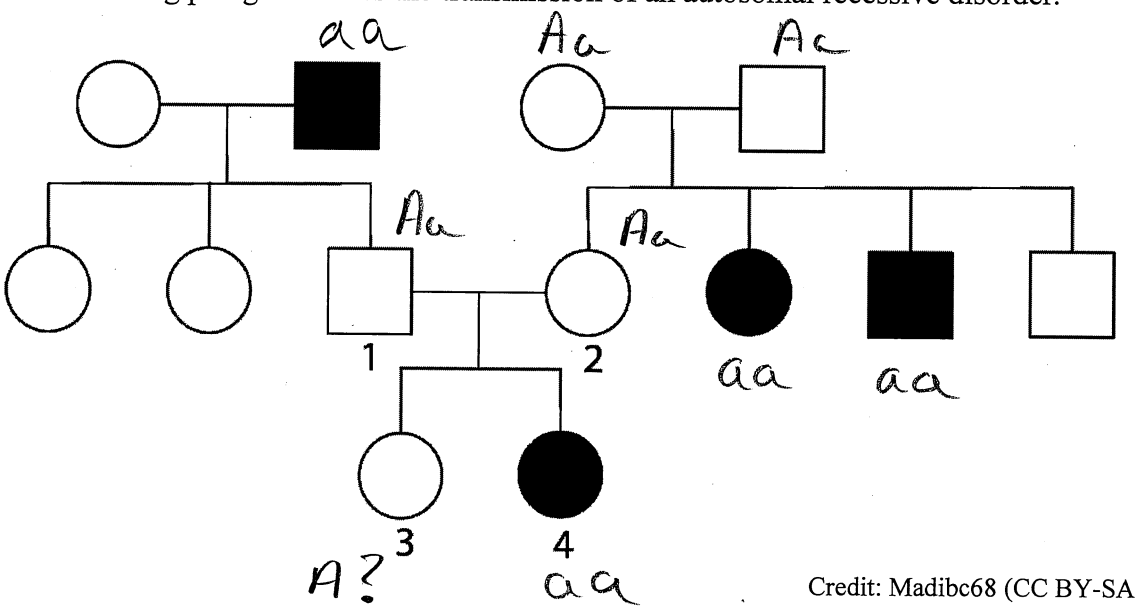
	X^H	Y
X^H	$X^H X^H$	$X^H Y$
X^h	$X^H X^h$	$X^h Y$

25%

	X^H	Y
X^h	$X^H X^h$	$X^h Y$
X^h	$X^H X^h$	$X^h Y$

50%

5. The following pedigree shows the transmission of an autosomal recessive disorder.



Credit: Madibc68 (CC BY-SA 4.0)

Indicate the genotypes of the four labeled people. Use "A" for dominant and "a" for recessive.

	genotype
Person #1	Aa
Person #2	Aa
Person #3	AA or Aa
Person #4	aa

	A	a
A	AA	Aa
A	AA	Aa

	A	a
A	AA	Aa
a	Aa	aa