Name _____

GENETICS: X LINKED GENES

****In fruit flies, eye color is a sex linked trait. Red is dominant to white ****

1. What are the sexes and eye colors of flies with the following genotypes:

X^RX^r red female X^RY red male X^rX^r white female.
X^RX^R red female X^rY white male

2. What are the genotypes of these flies:

white eyed, male X^rY red eyed female (heterozygous) X^RX^r
white eyed, female X^rX^r red eyed, male X^RY

3. Show the cross of a white eyed female X^rX^r with a red-eyed male X^RY.

	X^R	Y
X^r	X^RX^r	X^rY
X^r	X^RX^r	X^rY

4. Show a cross between a pure red eyed female and a white eyed male.
What are the genotypes of the parents: X^RX^R & X^rY

	X^r	Y
X^R	X^RX^r	X^RY
X^R	X^RX^r	X^RY

How many are:
white eyed, male 0%
white eyed, female 0
red eyed, male 50%
red eyed, female 50%

5. Show the cross of a red eyed female (heterozygous) and a red eyed male. What are the genotypes of the parents? X^RX^r & X^RY

	X^R	Y
X^R	X^RX^R	X^RY
X^r	X^RX^r	X^rY

How many are:
white eyed, male 25%
white eyed, female 0
red eyed, male 25%
red eyed, female 50%

Math: What if in the above cross, 100 males were produced and 200 females. How many total red-eyed flies would there be? 250

100 males (.5) = 50 + 200

6. In humans, hemophilia is a sex linked trait. Females can be normal, carriers, or hemophiliacs. Males will either have the disease or not (but they won't ever be carriers)

$X^H X^H$ = female, normal

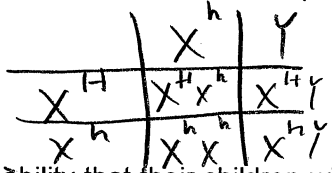
$X^H X^h$ = female, carrier

$X^h X^h$ = female, hemophiliac

$X^H Y$ = male, normal

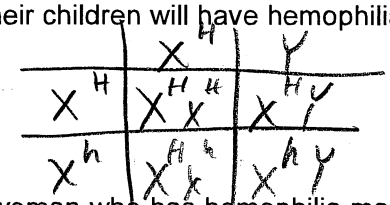
$X^h Y$ = male, hemophiliac

Show the cross of a man who has hemophilia with a woman who is a carrier.



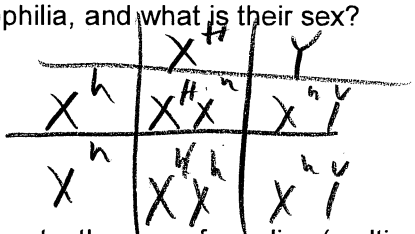
What is the probability that their children will have the disease? 50%

7. A woman who is a carrier marries a normal man. Show the cross. What is the probability that their children will have hemophilia? What sex will a child in the family with hemophilia be?



25%, male

8. A woman who has hemophilia marries a normal man. How many of their children will have hemophilia, and what is their sex?

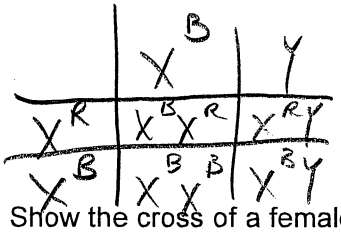


50%, male

9. In cats, the gene for calico (multicolored) cats is codominant. Females that receive a B and an R gene have black and oRange splotches on white coats. Males can only be black or orange, but never calico.

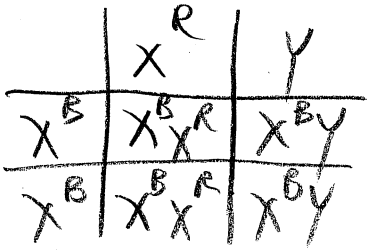
Here's what a calico female's genotype would look like. $X^B X^R$

Show the cross of a female calico cat with a black male?



What percentage of the kittens will be black and male? 25%
What percentage of the kittens will be calico and male? 0
What percentage of the kittens will be calico and female? 25%

10. Show the cross of a female black cat, with a male orange cat.



What percentage of the kittens will be calico and female? 50%
What color will all the male cats be? black