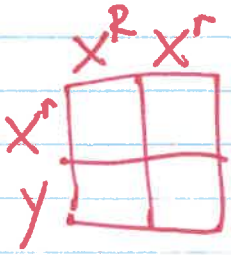
Practice w/ Sex Linkage

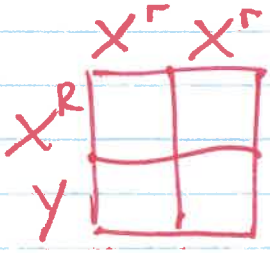
R: red eyes r: white eyes

1a. $X^R X^R$ / X^r, Y

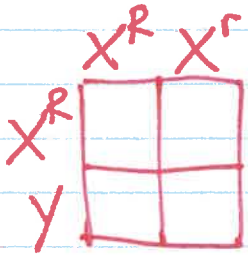
b. $X^R X^r$ / X^r, Y



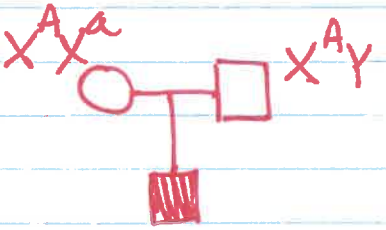
c. $X^r X^r$ / X^R, Y



d. $X^R X^r$ / X^R, Y



2a. $X^A X^a$ / $X^A Y$



mom: carrier

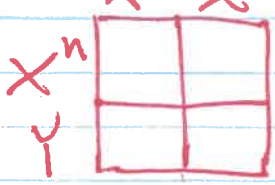
b.

Dad: $X^a Y$

Mom: $X^A X^a$

Daughter: $X^a X^a$

3a. $X^N X^n$ / X^n, Y



25% female, small notch
25% female WT
25% male, fatal
25% male WT

b. The male parent can only give an X^n to female offspring so all female offspring are either $X^N X^n$ or $X^n X^n$

c. All males w/ $X^N Y$ genotype will die before maturity, so will never reproduce.

4a.

female gametes	bv	by	male gametes
b+v+	b+bv+v (wild type female)	b+bv+y (wild type male)	

b.

b+v+	b+y	bv+	by	male gametes
b+v				
bv+				
bv				

female gametes

9: wild type female

3: brown-eyed female

3: vermilion-eyed male

1: white-eyed male

c.

bv+	b+v	bv	b+y	by	male gametes

female gametes

4: wild type female

4: brown-eyed female

4: wild type male

4: brown-eyed male

5. Larry: X^aY Lauren: X^AX^a Jake: X^AY

a. 0% chance — Jake can only give a dominant X^A to their daughter(s)

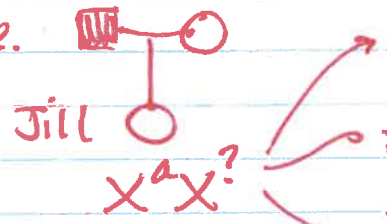
b. 50% chance — Lauren can give either X^A or X^a and their son(s) get only a Y from Jake

c. 50% chance — possible daughter genotypes:

X^AX^A or X^AX^a

d. $\left(\frac{1}{2}\right)^4 = \frac{1}{16}$ or 6.25%

e.



if Jill's mom has hemophilia: 0% normal

if Jill's mom: X^AX^A: 100% normal

if Jill's mom is a carrier: 50% normal

f. 3rd case in part e and if Jill is normal she must be a carrier because her dad gives a recessive X^a.

6. color blind man: X^cY

carrier wife: X^CX^c

possible daughter genotypes X^CX^c or X^CX^c
so 50% chance of a color blind daughter

possible son genotypes X^CY or X^cY
still 50% chance of their first son being color blind