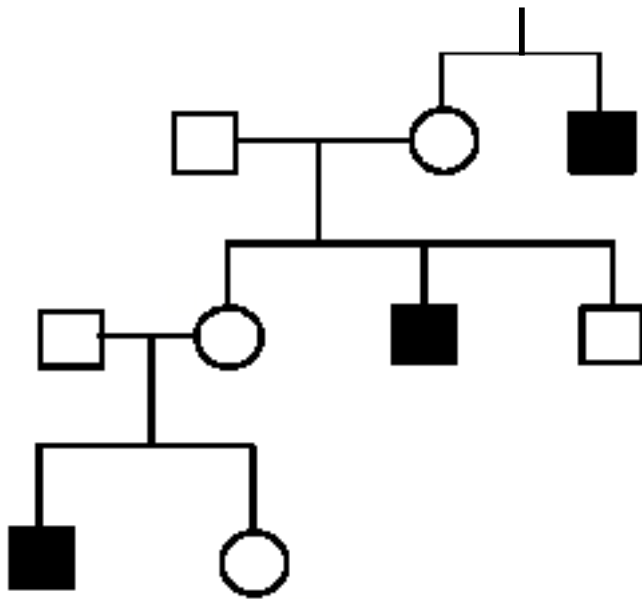


What is the most likely mode of inheritance in the pedigree shown below? Justify why it is the most likely. (10 points)



In *Drosophila*, two mutations, *Stubble* (*Sb*) and *curled* (*cu*), are linked on the third chromosome. *Stubble* (*Sb*) is a dominant mutation that produces short bristles and it is **lethal** when homozygous. *curled* is a recessive mutation that produces curled wings. You have a *Stubble*, normal winged female of the following genotype (where + indicates the wildtype form of each gene):

$$\frac{Sb}{Sb^+} \frac{cu}{cu^+}$$

You want to choose a *true breeding* male with a genotype that will allow you to observe all of the recombinant and non-recombinant progeny of this female. *What genotype would you choose? After mating the female and your male, what will be the genotypes and phenotypes of the resulting progeny?*

You are interested in producing a genetic map of three *recessive* mutations in *Drosophila*.

- One mutations produces a black body (b) and it is recessive to the grey wildtype allele (b+)
- One mutation produces small wings (sw) and it is recessive to the allele for normal wings (sw+)
- one mutation produces hooked bristles (h) and it is recessive to the wildtype allele that produces normally shaped bristles (h+)

You perform the following crosses (*read through this carefully*). Assume that the wild type phenotype for a particular trait is observed except when the mutant phenotype is explicitly mentioned. You cross a homozygous small winged female with a homozygous black, hooked male. All of the F1 look wild type for the three traits. The test cross of an F1 female with a homozygous small winged, black, hooked male gave the following results in the F2:

<u>Phenotypes</u>	<u>Number of Progeny</u>
Wildtype	169
black	19
black, hooked	301
small winged, hooked	21
hooked	8
hooked, small winged, black	172
small winged, black	6
small winged	304
Total	1000

A. What were the genotypes of the parental and F1 flies? (5 points)

B. Construct a genetic map showing the order and map distances between the genes.