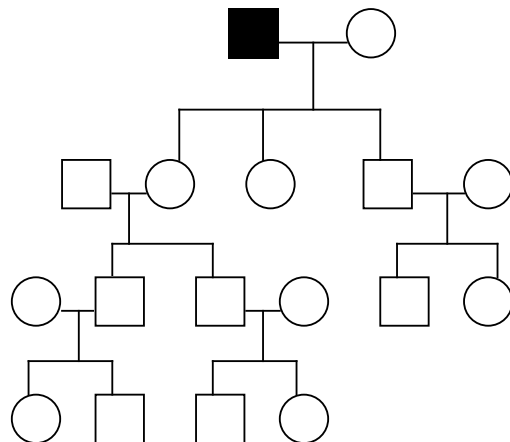


Genetics Staple or print double-sided! You will lose credit if you don't

1. You breed two white flowers together and get orange flowers that range from very light yellow orange to dark red-orange. When you cross the F1's you get a ratio of 9/16 colored to 7/16 white flowers, and the colored flowers by themselves are 1/4 in shades of light to dark red, 1/2 shades of orange, and 1/4 yellow. What type of inheritance is going on here? Use all the genetic terms that apply.

2. Solid white is dominant in cats and white cats are occasionally deaf. Assume that the likelihood of a heterozygous white cat being deaf is 2% and for a homozygous white cat the likelihood is 25%. Assume that all non-white cats hear. What is the likelihood of a kitten with two heterozygous white parents being white and deaf? Show your work!

3. The pedigree below is for an extremely rare sex-linked **dominant** trait. Only the first person affected is filled in. Fill in the individuals that must be affected. For later generations fill in individuals according to the proportions you'd expect. Be careful not to fill in individuals who cannot be affected!



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4. You have acquired 3 true-breeding strains of mice. One is tan, and the other two are white (white1 and white2). When you breed the white1 strain to the tan strain, all the F1s are black. When you breed the white2 strain to the tan strain, all the F1s are white. When you breed the two white strains together all the F1s are white, but in the F2 generation you get some black, a very few tan, as well as more whites. Assume all genes are fully penetrant and autosomally inherited.

a) What fraction of the F2 generation from white1 x white2 would you expect to be white?

b) What fraction of the F2s from above should be tan?

c) what would you expect to get (phenotype and ratio) in F2s from crossing the black F1s produced in the white1 X tan cross?

5. In a family of four girls and two boys, two of the four girls had a very rare condition where at puberty they did not grow pubic hair, never menstruated, and on examination did not have a uterus or ovaries, though in all other ways they appeared normal. Needless to say they were sterile. The other two girls married and had families. In one of the families there were more daughters than sons, and about half of the daughters were sterile. All of the boys and their descendents were normal. This pattern repeated in the next generation, a woman who had a sterile sister stood about a 50:50 chance of having a sterile daughter. What could explain this?