2017-10-9 Due Homework for curving Exam1 1 PTS/question

1. One type of roan color in horses is fully dominant over solid coat color, and results in the presence of white hairs interspersed among the solid color hairs. The locus for one type of paint in horses (Overo paint) is fully dominant, but when homozygous the Overo allele is lethal. The loci are autosomal and independent from each other. Two roan and paint horses that were heterozygous for both loci were crossed. What is the probability that their first offspring expresses both the solid coat and paint phenotypes? Consider only living progeny.

a. 1/6 (0.167) b. 8/12 (0.667) c. 5/12 (0.417) d. 1/2 (0.5) e. 9/16 (0.375)

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2. Raspberry colored eyes (ras) is sex-linked and recessive in ***Drosophila***. Flag shaped wings (fg) is on chromosome-2 and is an autosomal recessive. Ebony body color (e) is on chromosome-3 and is an autosomal recessive. A homozygous raspberry, ebony, flag female is crossed to a male that is true breeding normal alleles at all 3 loci. The F1 flies are inbred to produce an F2. Among the F2, how frequently would you expect to find a raspberry, flag (but not ebony) male?

a. 3/32 b. 1/16 c. 9/64 d. 3/64 e. 3/8

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3. In Guinea pigs, long hair is dominant to short hair, and dark hair is dominant to white hair. The loci are autosomal and independent from each other. If homozygous stocks are used, and a long dark haired Guinea pig is crossed to a short white haired Guinea pig, what will be the phenotype(s) seen in the F-1 generation?

a. all long dark hair b. all short white hair c. all short dark hair d. 1/2 short white, 1/2 long dark hair
e. 1/4 each of short white, long white, short dark, and long dark hair.

4. If dihybrid F-1 Guinea pigs are crossed, what proportion of the F-2 will look like the long dark haired parent?

a. 1/2 b. 2/3 c. 9/16 d. 3/4 e. 27/64.

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5. In peas, tall is dominant to short, round seed is fully dominant over wrinkled, and yellow is dominant to green. A pea plant that is known to be heterozygous for all three loci is crossed to an unknown plant. The results of the cross are given below: What was the genotype of the unknown plant?

Tall round yellow	900	Tall round green	900	Tall wrinked yellow	300
Tall wrinkled green	300	short round yellow	300	short round green	300
short wrinkled yellow	100	short wrinkled green	100	total = 3200	

a. Tt Rr Yy b. Tt Rr yy c. tt rr yy d. Tt rr yy e. tt rr Yy

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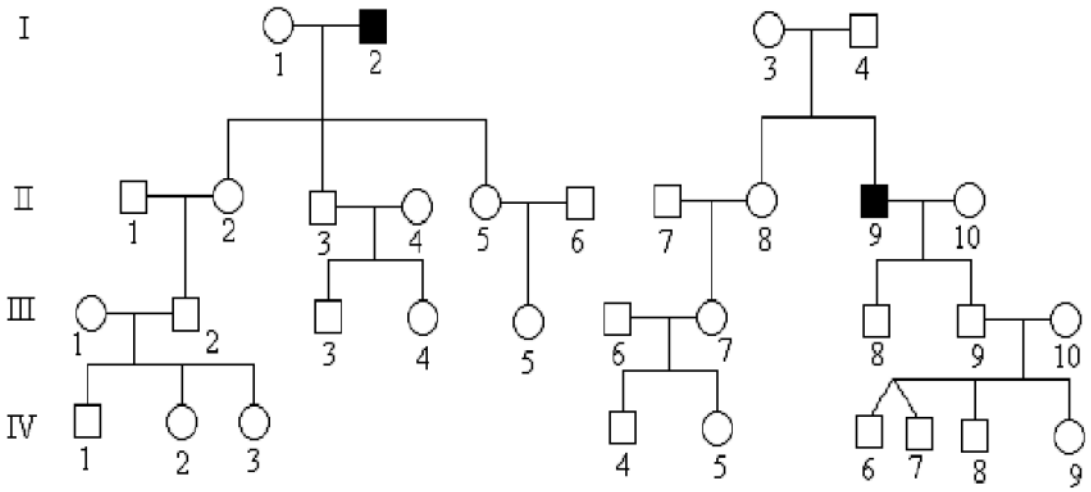
6. In a population of Hopi Indians the autosomal recessive gene for albinism exists at an allele frequency of 0.04. What proportion of these individuals are expected to be heterozygous?

a. 0.02 b. 0.00285 c. 0.0384 d. 0.0768 e. 0.0112

7. In the same population as above (#6), at what frequency would you expect albino offspring from brother/sister marriages?

a. 0.02 b. 0.00285 c. 0.0384 d. 0.0768 e. 0.0112

8-10. The following pedigree concerns two families, each with a history of the same disease, a disease inherited as an autosomal recessive.



8. If individuals IV-3 and IV-4 marry, what is the probability that their first child will have the disease?
a. 1/32 b. 1/48 c. 1/64 d. 1/12 e. 1/16

9. Statistically, this trait has a probability of 0.0001 in the population in which these families live. If IV5 is married with a man who is also in this community. What is the probability if your first child has this trait?
a. 0.0825% b. 0.0413% c. 0.165% d. 0.123% e. 0.246%

10. If the disease is inherited as an autosomal dominant trait with 50% penetrance, then what would be the possibility that the first child from the marriage of IV3 and IV4 shows this disease?
a 1.0 b. 0.0417 c. 0.0313 d. 0.1342 e. None of the answers.