Extra Question Chapter 4

1.) Consider the following cross concerning 4 different gene loci:

AaBbCcDd (x) AabbCcdd

a. From this cross, what is the probability of getting a progeny (offspring) with genotype AABbccdd? ¼ x ½ x ¼ x ½ = 1/64

b. From this cross, what is the probability of getting a progeny (offspring) with genotype AabbCcDd? ½ x ½ x ½ x ½ =1/16

c. From this cross, what is the probability of getting a male progeny (offspring) with genotype aaBbCcdd? ¼ x ½ x ½ x ½ = 1/32

2.) Your neighbor has twelve children.

- One is blue eye color and short.
- Two are brown eye color and short.
- Two are blue eye color and tall.
- Seven look just like the parents; brown eye color with tall.

What can you discover about the genetics of eye color and height of the children?

a. How many traits are you dealing with? 4 traits

   Each trait has ____2___ phenotypes:

   Specify the phenotypes.

   Brown or blue eyes

   Tall or short in size

   What is the probability of the height of the children? 75% chance of the child being tall and 25% short

   What is the probability of the eye color of the children? (Refer to monohybrid punnett square slides 17-19) 75% chance of the child having brown eyes and 25% of the child having blue eyes

b. What are recessive traits based on the calculated probability? Blue and short are recessive

c. What is the wild type? Brown eyes and being tall

3.) The phenotype ratio observed in children (7:2:2:1) is consistent with what we would expect for a typical F2 generation in a dihybrid cross (9:3:3:1), given that you don't have enough children for it to be 9:3:3:1.

d. What would be the parent's genotype of height and eye color? Remember that we are dealing with two traits. 4:2:2:1
e. Under the independent assortment principle, calculate the probability of genotype and phenotype of children with two traits. (Refer to dihybrid punnett square slides 34-35). 1/16