

**INS Biology Homework Week 3**

**NAME:** \_\_\_\_\_

**Due Wednesday, October 10**

Your responses should be relatively brief, providing only the necessary information to answer the question.

1. What mathematical equation would help you determine how many different chromosome arrangements at the metaphase plate of Meiosis I a cell could have? Use it to calculate the total possible number of chromosome arrangements at the metaphase plate of Meiosis I for a cell that is  $n=16$ .

2. On the back of this page, draw Punnett squares for these three crosses: A) white-eyed male crossed with a true-breeding red-eyed female; B) an F1 female from the cross in A with a red-eyed male; and C) an F1 female from the cross in A with a white-eyed male. Be sure to label all of your chromosomes for full credit!

3. Determine the genotypes of true-breeding flies (both male and female) for white-eyes and red eyes. Draw a cross between a true breeding white-eyed male with a true breeding red-eyed female. Draw the reciprocal cross.

4. What are the genotype ratios in female offspring when we cross true-breeding red-eyed males with a female that is heterozygous for eye color? In the same cross, what are the genotype and phenotype ratios of the males?

5. If genes lie on chromosomes, and chromosomes assort independently, then what type of assortment should we expect from genes that lie on the SAME chromosome, dependent assortment or independent assortment? Explain your reasoning.

6. How many gamete types can a female who is heterozygous for eye color and body color produce?

7. What phenotypic ratios do we expect in female offspring from a cross between  $X^{w+y}/X^{wy+}$  and  $X^{wy+}/Y$ ?