

### PRACTICE PROBLEMS 3

1. A yeast clone of genotype *a ade MET* was mated to one of genotype *ADE met*. The resulting diploids were sporulated, giving progeny of the following genotypes for the auxotrophic markers:

<i>ADE MET</i>	15
<i>ADE met</i>	33
<i>ade MET</i>	39
<i>ade met</i>	13

- Which are the parental genotypes?
- Which are the recombinant genotypes?
- What is the recombination frequency between these *ade* and *met* loci?

2. A diploid yeast clone of genotype *ADE ade MET met* was sporulated, giving progeny of the following genotypes:

<i>ADE MET</i>	42
<i>ADE met</i>	12
<i>ade MET</i>	16
<i>ade met</i>	30

- What was the phenotype of the diploid?
- Which are the parental genotypes?
- Which are the recombinant genotypes?
- What is the recombination frequency between these *ade* and *met* loci?

3. A female *Drosophila* with wild type body color and wing type was test crossed to a homozygous recessive male with black body and vestigial wings. The following numbers of progeny were produced:

vestigial	63
wild type	12
black vestigial	13
black	62

- Next to each genotype, write P or R to show whether it is Parental or Recombinant.
- What frequency of eggs produced by the female have a chromosome with recombination between the *black* and *vestigial* genes?

4. In maize, the alleles *C* and *c* determine colored vs. colorless seeds; *Wx* and *wx* determine nonwaxy vs. waxy endosperm; and *Sh* and *sh* determine plump vs. shrunken endosperm. Plants grown from seeds heterozygous for each of these pairs of alleles were testcrossed to plants from colorless, waxy, shrunken seeds, the progeny seeds were:

<i>c c Wx wx sh sh</i>	84
<i>c c Wx wx Sh sh</i>	974
<i>c c wx wx sh sh</i>	20
<i>c c wx wx Sh sh</i>	2349
<i>C c wx wx sh sh</i>	951
<i>C c wx wx Sh sh</i>	99
<i>C c Wx wx sh sh</i>	2216
<i>C c Wx wx Sh sh</i>	<u>15</u>
<b>Total</b>	<b>6708</b>

**Draw a linkage map showing the order of these three loci and the distances between them (in map units).**