1. (2) The wild type map of a series of genes on a chromosome is shown on the left and the map of a variant chromosome in the same species is shown on the right:

\[
\begin{array}{cccccccc}
A & B & C & D & E & F & G & H & I \\
A & B & H & C & D & E & F & G & H & I \\
\end{array}
\]

Which of the following events would give rise to the mutant chromosome?

(a) translocation  
(b) inversion  
(c) deletion  
(d) non-duplicative transposition  
(e) duplicative transposition

2. (2) A crossover between the bold regions on the chromosome below will result in what?

\[
\begin{array}{cccccccccccccccc}
A & B & C & D & E & F & G & H & I & J & K & L & M \\
\end{array}
\]

(a) translocation  
(b) inversion  
(c) deletion  
(d) duplication  
(e) transposition

3. (2) In yeast, the diploid produced by mating two different uracil auxotrophs will grow on minimal medium. Are the two mutants alleles of the same gene? circle one:

Yes  
No

4. (4) The figure below shows a diploid that is heterozygous at 3 loci, \( a \), \( b \), and \( c \). The centromere is shown by a circle. Suppose there is a mitotic crossover in G2, between the \( b \) and \( c \) loci.

(a) Circle the locus or loci that might become homozygous in a daughter cell after the crossover:

\[
\begin{array}{cccc}
\text{a} & \text{b} & \text{c} \\
\end{array}
\]

(b) What is the probability that the daughter cells will be homozygous following this mitotic crossover?

\[
\frac{1}{2}
\]