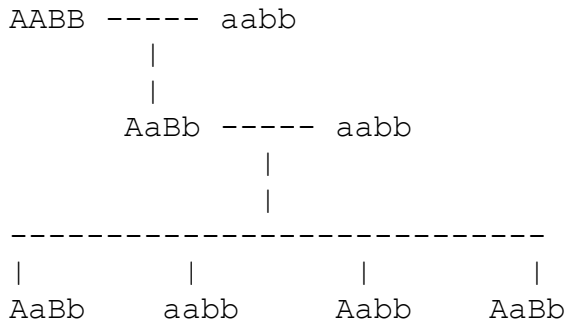


1. Consider the following pedigree:



- For each individual in the tree, infer the two haplotypes (redraw the tree if helpful).
- How many recombination and non-recombination events occurred with certainty among the 4 children? Are there any undetermined events (you cannot determine whether there was recombination or not)?
- Compute the LOD score of this pedigree given  $\theta = 0.1$ .
- Compute the maximum LOD score for  $\theta$  over the range  $[0, 0.5]$
- Using this  $\theta_{\max}$  as an estimate of the true recombination fraction, what is the genetic distance between these loci accounting for multiple crossover events?
- Repeat part (b), but for the above pedigree omitting the grandparent generation (phase unknown).

