

11. There are $2N - 2$ parameters. Of these, $N - 3$ are edge lengths, and 1 is for the rate matrix Q . (Although the K2P model has two rate parameters in Q , one of these can be arbitrarily set to 1, since the effect of this is just to rescale edge lengths by a constant factor.)

Chapter 9

10. a) If a subset of 4 taxa includes A_n , then the two trees induce different quartet trees. If a subset does not include A_n , they induce the same quartet tree. Therefore the distance is the number of subsets of 4 taxa that contain A_n . That is the same as the number of ways we can pick 3 taxa from A_1, A_2, \dots, A_{n-1} , which is $\binom{n-1}{3} = \frac{(n-1)(n-2)(n-3)}{1 \cdot 2 \cdot 3}$.
- b) There are $\binom{n}{4} = \frac{n(n-1)(n-2)(n-3)}{1 \cdot 2 \cdot 3 \cdot 4}$ subsets of 4 taxa, so the proportion of them counted in part (a) is $\frac{4}{n}$.