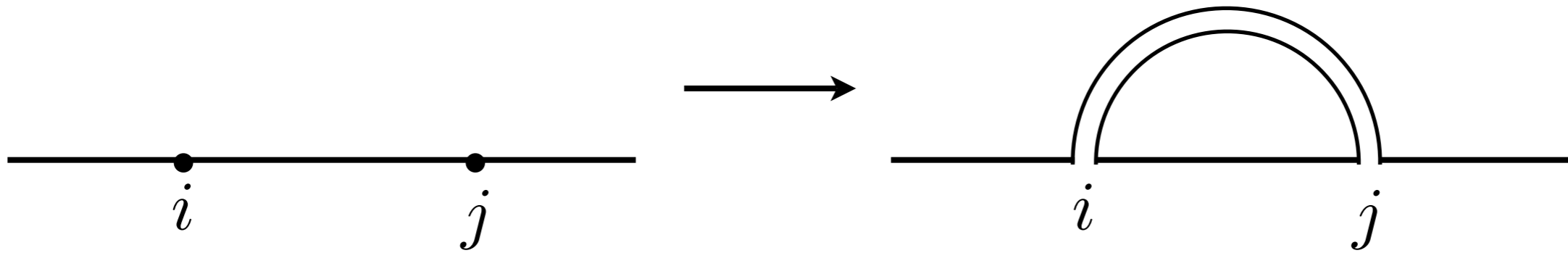
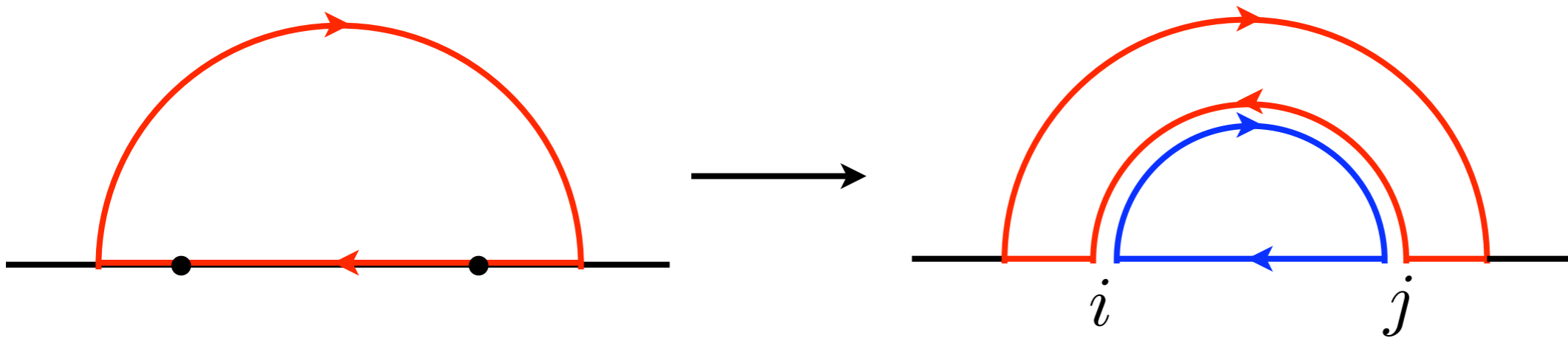


To calculate the genus, one must represent base pairs as double lines. This process creates loops in the diagram.

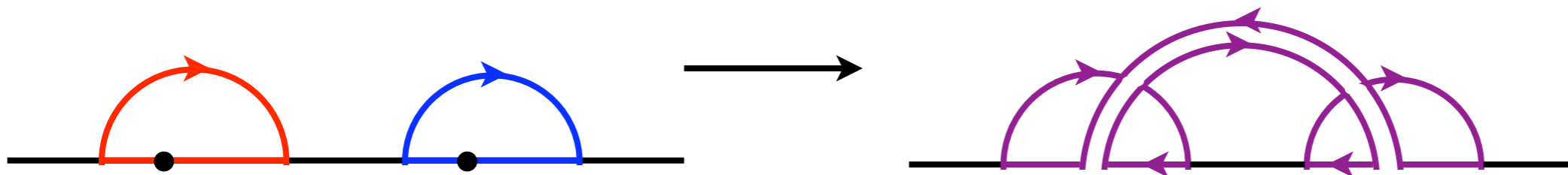


If position i and j belong to the same loop, then creating a double line between i and j results in the creation of a new loop. The diagram contains one more loop.



$$\Delta L = +1$$

If position i and j belong to two different loops, then we observe that creating a double line between i and j merges these two loops into one. The diagram contains one less loop.



$$\Delta L = -1$$