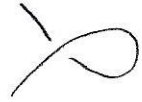


4.1.

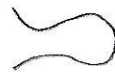
$R1'$



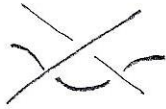
$R1$



$R2$



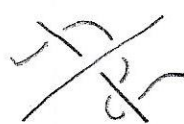
$R3'$



$R2$



$R3$



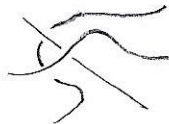
$R2$



$R3''$



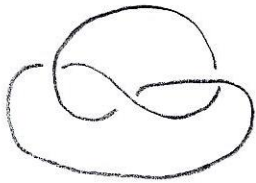
\rightarrow



$R0$



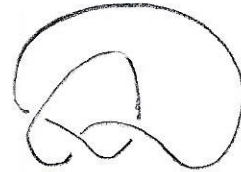
4.2.



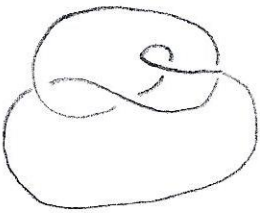
\cong



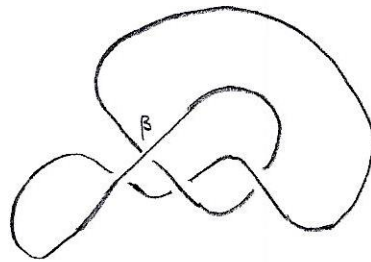
$R0$



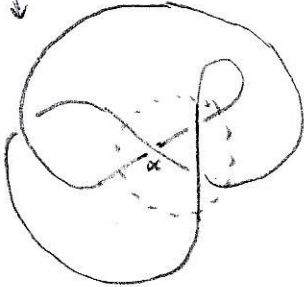
$R1$



$R1$

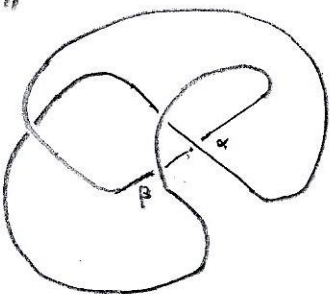


$R0$

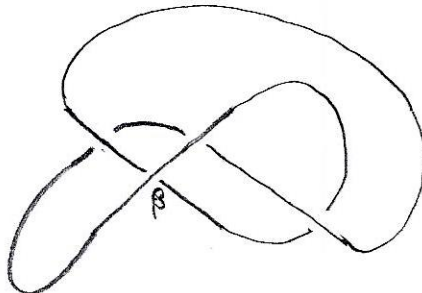


$R3'$

$R3'''$



$R0$



4.4. a).



Use 3 colours, r, g, b , in one crossing.

Then the other two crossings have to be given colours that will violate the

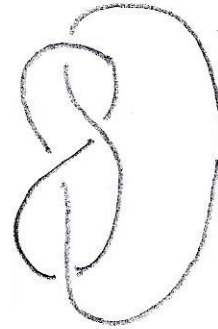
rules in the final crossing. Hence it is not tricolourable.

4.5.

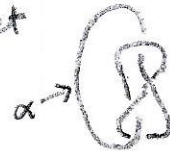
E :



\bar{E} :

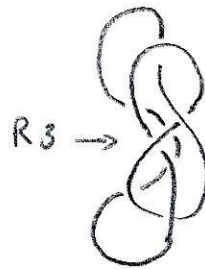
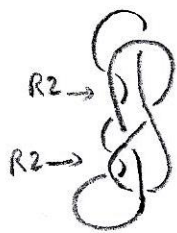
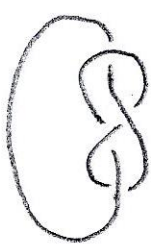


To transform E to \bar{E} , rotate E to get



and then move the strand α to the other side.

To do this with R.M, use R_2 to get the right configuration so that you can apply R_3 , for example:



etc.