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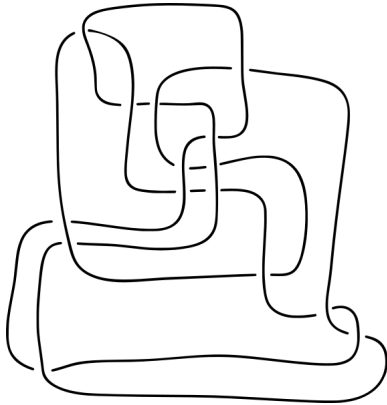
Answer **all** questions completely in the space provided. Show all work and explain your reasoning. Good Luck!!!

**Part I - Definitions and Theorems. State the following definitions.**

1. (3 points) A knot is ...
2. (3 points) The crossing number of a knot  $K$  is ...
3. (2 points) The unknotting number of a knot  $K$  is ...
4. (2 points) A knot  $K$  is tricolorable if ...

**Part II - Calculate.** Answer the following questions. Include all work and explain your reasoning.

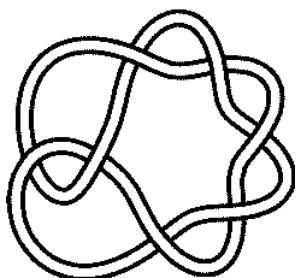
5. (10 points) Find the crossing number of the following knot. Explain your reasoning.



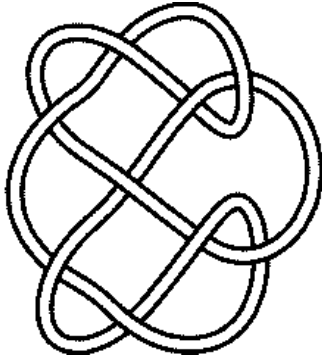
6. (10 points) Use Reidemeister moves to make the knot below into its simplest projection. Show all steps.



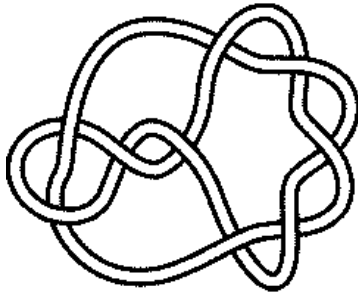
7. (10 points) Find the unknotting number of the following knot. Explain your reasoning.



8. (10 points) Is the  $9_{23}$  knot (shown below) tricolorable? Explain.



9. (10 points) Is the  $9_6$  knot (shown below) 5-colorable? Explain.



10. (10 points) Draw your knot, and tell me something interesting about it.