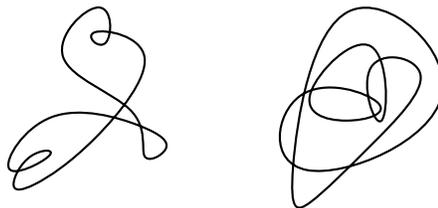


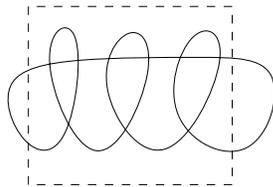
## Comprehension questions

PROBLEM 17.1. Draw an explicit sequence of moves that transforms one of these loops into the other:



PROBLEM 17.2. Show that the  $J^-$  and  $J^+$  invariants for a loop are the same as for its mirror image (the reflection along any axis).

PROBLEM 17.3. Compute the  $J^+/J^-$  invariants of this (for a general  $k$ ), and explain how you did it:

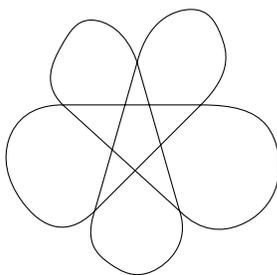


$k$  curls of this type (here,  $k = 3$  is drawn)

PROBLEM 17.4. Compute the  $J^+/J^-$  invariants of the loop from Problem 16.5 (for a general  $k$ ), and explain how you did it.

PROBLEM 17.5. Re-compute the  $J^-$ -invariant of the loop from Example 17.7 using the Viro-Gutkin formula.

PROBLEM 17.6. Compute the  $J^+/J^-$  invariants of this, and explain how you did it:



PROBLEM 17.7. Compute the  $J^+/J^-$ -invariants of the loop from Example 16.8. It's enough to just state the answer.

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