

ReidemeisterThree@k\_MD := ReidemeisterThree@k =

Block[ {b, f, n = Length@k, p = List @@ Build@k // ( $\#^T \cup (\text{Abs}@\text{Reverse}@\# \text{Sign}@\#)^T$ )<sup>T</sup>[[2]] &,  
v, y = {}}, b = Abs@p // #Mod[#[[1]] + {1, -1}, 2 n, 1]] &;

Do[f = Mod[Abs@p[[i]] + {1, -1}, 2 n, 1] // If[OddQ@i, Abs@p[[#]], #] &;

Do[If[{c, i - 1, i} // Total[Sign@p[[#]]]<sup>2</sup> == 1  $\bigwedge$  MemberQ[(Abs@p[[#]]  $\cup$  #) [[2 ;; 3]], i] &,

(\*The third Reidemeister move can be made with the given settings.\*)

v = p[{Abs@p[[c]], Abs@p[[i - Mod[i, 2]]], i - Mod[i + 1, 2]]}]/2;

If[DuplicateFreeQ@v, AppendTo[y, k /. (v[[#1]]  $\rightarrow$  -Abs@v[[#2]] Sign@v[[#3]] & @@@  
{ {1, 2, 3}, {2, 3, 1}, {3, 1, 2} })]]], {c, b  $\cap$  f}];

b = f, {i, 2, 2 n}];

KnotSort[Minimal /@ y  $\cup$  {}]]];