

ReidemeisterThree@k gives all the knots that can be obtained by applying one third Reidemeister move to the knot k , which is given in modified DT form.

ReidemeisterThree@k_MDT :=

```

ReidemeisterThree@k = Block[{b, f, n = Length@k,
  p = List@@Build@k //
    (#T ∪ (Abs@Reverse@# Sign@#)T)T[[
      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[[#]]]2 == 1 &&
      MemberQ[(Abs@p[[#]] ∪ #)[[2 ;; 3]], i] &,
    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]] → -Abs@v[[#2]] Sign@v[[#3]] &@@@
        {{1, 2, 3}, {2, 3, 1}, {3, 1, 2}})]],
    {c, b ∩ f}];
  b = f, {i, 2, 2 n}];
KnotSort[Minimal /@ y ∪ {}]]];

```