Recall that a diagram $D$ is $n$–colourable if there is a labelling of the arcs of $D$ by elements of $\mathbb{Z}_n$ using at least two distinct elements and satisfying the rack

$$a^b = a \triangleright b := 2b - a \pmod{n}.$$ 

**Exercise 2.1** (Easy). Verify that if $(G, \cdot)$ is a group then $(G, \triangleright)$ is a rack where

$$a \triangleright b := b \cdot a \cdot b^{-1}.$$ 

**Exercise 2.2.** Show that for every $n$, the unknot is not $n$–colourable and the unlink is $n$–colourable.

**Exercise 2.3.** Use colourability to show that the $7_8^2$ link, shown below, is not the unlink.

**Exercise 2.4.** Give an example of two distinct knots $K$ and $L$ for which $K$ is $n$–colourable if and only if $L$ is $n$–colourable.

**Exercise 2.5.** Show that the granny knot and the square knot, shown below respectively, have isomorphic fundamental groups.