

Diagrammatic proof of the identity $D_3^{u,u'} * D_1^{u',u'''} = D_1^{u,u''} * D_3^{u,u'}$ using strand crossings and the identity element e_2^u .

The diagram shows the following sequence of transformations:

- Initial expression: $D_3^{u,u'} * D_1^{u',u'''}$. The first diagram has three strands labeled u (bottom), u' (middle), and u''' (top). The second diagram has three vertical red strands.
- First transformation: $= D_1^{u,u''} * D_3^{u,u'}$. The first diagram has a crossing between the u and u' strands. The second diagram has a crossing between the u' and u''' strands.
- Second transformation: $= D_3^{u,u'} * e_2^{u'}$. The first diagram has a vertical blue strand for u and a red dot on the u' strand. The second diagram has a crossing between the u and u' strands.
- Third transformation: $= e_2^u * D_3^{u,u'}$. The first diagram has a vertical blue strand for u and a red dot on the u' strand. The second diagram has a crossing between the u and u' strands.