Sheet 00: Differentiation and Integration

Solution Optional Problem 1: Permutations [4]

(a)

(b)
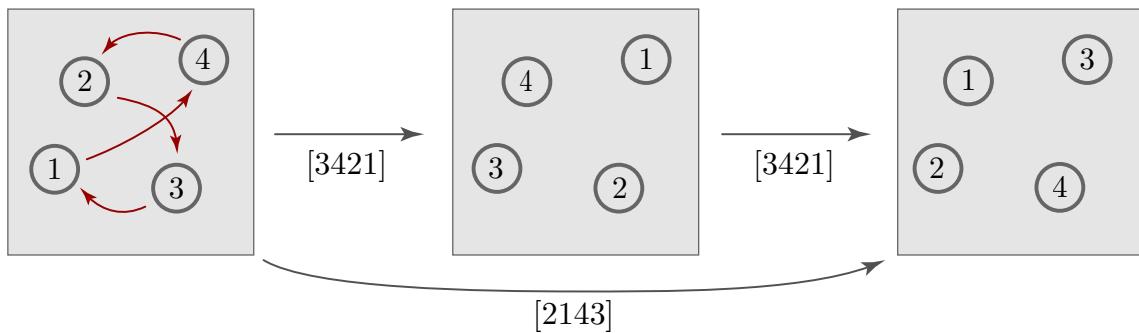
$$123 \overset{[321]}{\longmapsto} 321 \overset{[132]}{\longmapsto} 231 \qquad \Rightarrow \quad [231] = [132] \circ [321].$$

$$1234 \overset{[2134]}{\longmapsto} 2134 \overset{[3214]}{\longmapsto} 2314 \qquad \Rightarrow \quad [2314] = [3214] \circ [2134].$$

$$1234 \overset{[2431]}{\longmapsto} 2431 \overset{[1243]}{\longmapsto} 2341 \overset{[4231]}{\longmapsto} 2314 \Rightarrow [2314] = [4231] \circ [1243] \circ [2431].$$

[Total Points for Optional Problems: 4]