A2.2 The symmetric group S_n

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Part 1

Two generators, like (12) and (23). They just must not be even both, because one could not build up odd permutations out of them.

Part 2

$$(1\,6\,2\,3)(3\,6\,4\,5)(1\,3\,4\,2) = (1\,2\,6\,4\,3\,5)$$

Algorithm: Take a number (↓), see where it goes (↺, ↷) and what the final result (↗) is. Write that pair to the right. Repeat that process with the number you got (2 here) and see where that goes (6 here).

Part 3

$$\left[(1\,2\,3\,4\,5\,6)(7\,8\,9\,\underline{10}\,\underline{11})\right]^{30}$$

$$= (1\,2\,3\,4\,5\,6)^{30}\,(7\,8\,9\,\underline{10}\,\underline{11})^{30}$$

disjoint cycles

$$= e^5 \cdot e^6 = e$$

To me it is trivial that a cycle of k element will become the identity after k applications. Patrick said that he looks into how trivial that actually B.