

$s = (1, 2, 3, \dots, n)$

$1) s = (1, 2, 3, 4, 5) \circ (2, 4) = (1, 5, 3, 2, 4)$
 $t = (1, 5, 3, 2, 4) \circ (2, 4) = (1, 2, 3, 4, 5)$

$2) s = (1, 2, 3, 4, 5) \circ (1, 2, 3) = (2, 1, 3, 4, 5)$
 $t = (2, 1, 3, 4, 5) \circ (1, 2, 3) = (1, 2, 3, 4, 5)$

$3) s = (1, 2, 3, 4, 5) \circ (1, 2, 3, 4) = (1, 4, 3, 2, 5)$
 $t = (1, 4, 3, 2, 5) \circ (1, 2, 3, 4) = (1, 2, 3, 4, 5)$

$s^2 = (1, 2, 3, 4, 5) \circ (1, 2, 3, 4, 5) = (1, 2, 3, 4, 5)$
 $s^3 = (1, 2, 3, 4, 5) \circ (1, 2, 3, 4, 5) = (1, 2, 3, 4, 5)$
 $s^4 = (1, 2, 3, 4, 5) \circ (1, 2, 3, 4, 5) = (1, 2, 3, 4, 5)$
 $s^5 = (1, 2, 3, 4, 5) \circ (1, 2, 3, 4, 5) = (1, 2, 3, 4, 5)$

3 4-17:57

$(s^{120} \circ t^3)^{14} \circ u^{23}$

$s^{120} = [(1, 2, 3, 4, 5) \circ (2, 4)]^{120} = (1, 2, 3, 4, 5)$
 $t^3 = [(1, 2, 3) \circ (4, 5)]^{-3} = (1, 2, 3)$
 $u^{23} = [(1, 2, 3, 4) \circ (3, 4, 5, 6)]^{23} = (1, 2, 3, 4) \circ (3, 4, 5, 6)$

$(s^{120} \circ t^3)^{14} \circ u^{23} = [(1, 2, 3, 4, 5) \circ (1, 2, 3)]^{14} \circ (1, 2, 3, 4) \circ (3, 4, 5, 6)$

$\begin{matrix} 1 \rightarrow 2 \\ 2 \rightarrow 3 \rightarrow 8 \\ 3 \rightarrow 1 \rightarrow 5 \\ 5 \rightarrow 6 \\ 6 \rightarrow 3 \rightarrow 1 \end{matrix}$

3 4-18:24

$s = (1, 2, 3, 4, 5) \circ (1, 2) = (1, 2, 4, 3, 5)$
 $t = (1, 2, 3, 4, 5) \circ (1, 2, 3) = (1, 3, 2, 4, 5)$

$s^2 = (1, 2, 4, 3, 5) \circ (1, 2) = (1, 2, 3, 4, 5)$
 $t^2 = (1, 3, 2, 4, 5) \circ (1, 2, 3) = (1, 2, 3, 4, 5)$

$s^3 = (1, 2, 4, 3, 5) \circ (1, 2, 4, 3, 5) = (1, 2, 3, 4, 5)$
 $t^3 = (1, 3, 2, 4, 5) \circ (1, 2, 3, 4, 5) = (1, 2, 3, 4, 5)$

$s^4 = (1, 2, 4, 3, 5) \circ (1, 2, 4, 3, 5) = (1, 2, 3, 4, 5)$
 $t^4 = (1, 3, 2, 4, 5) \circ (1, 2, 3, 4, 5) = (1, 2, 3, 4, 5)$

$s^5 = (1, 2, 4, 3, 5) \circ (1, 2, 4, 3, 5) = (1, 2, 3, 4, 5)$
 $t^5 = (1, 3, 2, 4, 5) \circ (1, 2, 3, 4, 5) = (1, 2, 3, 4, 5)$

3 4-18:32

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

a) $(1, \dots, 2, \dots, 1)$

b) $(1, 2) \dots$

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

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

3 4-18:43

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

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

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

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

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

3 4-18:52

$\langle n \rangle, M = \{[15]_{60}, [6]_{60}\}$

$[15]_{60} \in \langle n \rangle, [6]_{60} \in \langle n \rangle$
 $[30]_{60} \in \langle n \rangle, [2]_{60} \in \langle n \rangle$
 $[9]_{60} \in \langle n \rangle, [4]_{60} \in \langle n \rangle$
 $[12]_{60} \in \langle n \rangle, \dots$

$\langle [15]_{60}, [6]_{60} \rangle = \langle [3]_{60} \rangle$

$\langle [3]_{60} \rangle = \{[3]_{60}, [6]_{60}, [9]_{60}, [12]_{60}, [15]_{60}, [18]_{60}, [21]_{60}, [24]_{60}, [27]_{60}, [30]_{60}, [33]_{60}, [36]_{60}, [39]_{60}, [42]_{60}, [45]_{60}, [48]_{60}, [51]_{60}, [54]_{60}, [57]_{60}, [60]_{60}\}$

$[15]_{60} \in G \Rightarrow [15]_{60} - [6]_{60} = [9]_{60}$
 $[6]_{60} \in G \Rightarrow [6]_{60} - [6]_{60} = [0]_{60}$

$\langle \alpha_1, \alpha_2 \rangle$

3 4-19:00

