

$$1.1.a. (14)(273) \in S_7$$

$$b. (13)(25) \in S_5$$

$$c. \begin{array}{cccccccccccc} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 & 11 & 12 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 2 & 11 & 8 & 10 & 4 & 3 & 2 & 6 & 1 & 5 & 9 & 12 \end{array}$$

$$1.2.1. k^{-1} = (475)(231)$$

$$\begin{aligned} \therefore k k^{-1} &= (579)(132)(475)(231) \\ &= (1)(2)(3)(4)(7)(9)(6) \\ &= e \end{aligned}$$

$$\begin{aligned} 2. y k k &= (14278)(145)(579)(132) \\ &= (1379458)(2)(6) \\ &= (1379458) \end{aligned}$$

$$\begin{aligned} 3. k^{-1} y k k &= (475)(231)(1379458) \\ &= (3582)(49) \end{aligned}$$

1.3.1. 5

2. 3 } LCM of individual

3. 6 } cycle orders

$$4. (12345)(678)$$

5. 19 is prime so no decomp

in  $S_{10}$  i. no.  $\square$

6. Yeah, LCM stuff !!

$$1.4. (132)\sigma = (12)(34)$$

$\therefore \sigma \in S_4$

$$\begin{aligned} \hookrightarrow \sigma &= (132)^{-1}(12)(34) \\ &= (231)(17)(84) \\ &= (134) \end{aligned}$$

$$1.5. (132)(574)\sigma = (12)(34)$$

$\therefore \sigma \in S_7$

$$\begin{aligned} \hookrightarrow \sigma &= (132)^{-1}(574)^{-1}(12)(34) \\ &= (231)(475)(12)(34) \\ &= (13754)(2)(6)(7) \\ &= (13754) \end{aligned}$$

$$1.6. \sigma = (987654321)(987654321)$$

$$= (186429753)$$