

check by the subgroup axioms.

From the Cayley table, the set is closed. (Also, each element appears once in each row and each column). (SG1)

The identity,  $e$ , is a member of the set

The identity,  $e$ , appears once in each row and each column. (It is also symmetric about the main diagonal).

Hence each element has an inverse that is a member of the set.

The three subgroup axioms hold, therefore the set of elements from part (a) forms a subgroup of  $S_6$ .

d) Using the method in part (a)

153642	153642	153642	153642
123456	612345	561234	456123
(12645)(3)	(16325)(4)	(156243)	(142365)

153642    153642

345612    234561

(1354)(2)(6)    (12)(3465)

5757

the set of elements that conjugate (153642) to (123456) is, dropping the fixed points, ((2645), (16325), (156243), (14236), (1354), (12)(3465))

e) Choose (156243) =  $p$ .

$$(156243) \circ (124635) = (14236)(5)$$

$$(156243) \circ (143)(265) = (1354)(2)(6)$$

$$(156243) \circ (16)(23)(45) = (12)(3465)$$

$$(156243) \circ (134)(256) = (1)(2645)(3)$$

$$(156243) \circ (153642) = (16325)(4)$$

$$(156243) \circ e = (156243)$$