of the compositions of two elements of S_5 of even length, ie A_5 includes elements of the form

$(**)(**)(*)$
$(***)(*)(*)$
$(*)(*)(*)(*)(*)$
$(**)(**)(*)$

The element $(***)(*)(*)$ generates a subgroup order 3
The element $(**)(**)(*)$ is self inverse, and composed with an element of order 3 will produce an element of order (a.) ?
Composing again will produce another element order 2 and the subgroup will be isomorphic to D_3, which has order 6 but is not cyclic.

This is the only subgroup type of order 6 which can be produced as any subgroup involving an element of form $(*****)$ would have order divisible by 5, which 6 is not, and any subgroup involving only elements of type $(***)(*)(*)$ or $(**)(**)(*)$ would not be divisible by 2 and 3 resp

3/4 (P.T.O)