HW3  (Due Wed March 29, 2017)

1. Consider the subgroup of $S_4$ given by $G = \langle (1234), (13) \rangle$.
   (a) What is the order of $G$?
   (b) What are the orders of the elements of $G$, and how many elements of each order does $G$ have?
   (c) What are the orders of the subgroups of $G$? Give an example of a subgroup of each such order.

2. Consider the subgroup of $S_4$ given by $G = \langle (123), (134) \rangle$.
   (a) What is the order of $G$?
   (b) What are the orders of the elements of $G$, and how many elements of each order does $G$ have?
   (c) What are the orders of the subgroups of $G$? Give an example of a subgroup of each such order.

You may use Maple to help with your calculations, as in the example shown on the left. See the course website for instructions on configuring your Maple session. Refer to the following example to get you started, in which we compute the order of the subgroup $G = \langle (123)(45), (12) \rangle \leq S_5$ as well as listing its elements and even a Cayley Table.

Further help using Maple and the GroupTheory package is found using the builtin help feature. Regardless of whether you work by hand or by computer, this assignment is asking you for short clear answers rather than full justification (and if you work by computer, full justification is not really an option).