1. The following is a partially completed Cayley table for a group.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	1	2	3	4	5	6	7	8
2	2	1	4	3	6	5	8	7
3	3	4	2	1	7	8	6	5
4	4	3	1	2	8	7	5	6
5	5	6	8	7	1			
6	6	5	7	8		1		
7	7	8	5	6			1	
8	8	7	6	5				1

   (a) Complete the Cayley table.

   (b) Find the centralizer of each member of the group.

   (c) Find $Z(G)$.

   (d) What is the order of 2? 3? 4?

   (e) Find a proper subgroup, H, containing 2 and 3.

   (f) Is H cyclic? If so, what is a generator?

2. Let $H_1, H_2, H_3, ...$ be a sequence of subgroups of a group with the property that $H_1 \subseteq H_2 \subseteq H_3 ....$ Prove that the union of the sequence is a subgroup.