

Name \_\_\_\_\_

Mathematics 309a: Abstract Algebra

Winter Semester 2009

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Quiz #8

February 26

1.  $S_5$ , the group of permutations of  $\{1, 2, 3, 4, 5\}$ , has \_\_\_\_\_ elements.
2.  $A_5$ , the subgroup of all even permutations in  $S_5$ , has \_\_\_\_\_ elements.
3.  $H = \{ \iota, (12)(35), (13)(25), (15)(23) \}$  is a subgroup of  $A_5$ . Since  $H$  has 4 elements, it must be either  $V_4$  or  $Z_4$ . Which one is it? \_\_\_\_\_

Why? \_\_\_\_\_

4.  $\langle (125) \rangle$  is the cyclic subgroup of  $A_5$  generated by  $(125)$ . Write out its elements:

\_\_\_\_\_

5.  $\langle (14325) \rangle$  is a cyclic subgroup of  $S_5$  generated by  $(14325)$ . Write out its elements:

\_\_\_\_\_

6. Give two non-isomorphic subgroups of  $S_5$  of order 4.

\_\_\_\_\_

and \_\_\_\_\_.

7. Give a subgroup of  $S_5$  that has 24 elements. [You don't have to write out all 24 elements to show your answer!]

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