

**Math 619 Fall 2012- Homework #1- Due Tuesday September 11, 2012**

1. Dummitt and Foote:

1.4 #7

1.6 #17, 24, 26

1.7 # 17

2. What are the orders of the groups

$$G = \langle x, y \mid x^3 = y^2 = (xy)^3 = 1 \rangle$$

and

$$G = \langle x, y \mid xy^2 = y^3x, yx^3 = x^2y \rangle.$$

Be sure to justify your answers.

3. Let  $\sigma = (12)(34) \in S_4$ . Compute the centralizer  $C_{S_4}(\sigma)$ . Which familiar group is it isomorphic to? Repeat for  $\sigma = (12)(34) \in S_6$ .

4. Let  $F$  be a field. Determine the center of the group  $GL_n(\mathbb{F})$  and prove your answer. What changes for  $SL_n(F)$ ?

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