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Modern Algebra
MATH 325W – Spring 2015

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Monday:	Chapter 20-21: Cosets and Lagrange	
Wednesday:	Chapter 23: Normal Subgroups	**Week 13**
Friday:	Review for Exam 3	

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HOMEWORK

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Homework #22   **due Tuesday, April 28**
    Ch. 20: #4(b)(c), 6(b)(c), 8(b)(c), 10, 15
    Ch. 21: #2, 5, 6, 8

Homework #23   **due Friday, May 1**
    Ch. 21: #20, 22, 46, 48
    ~~Ch. 23: #3, 6, 8~~
    ~~AP #1: Define $SL_2(\mathbb{R}) := \{A \in GL_2(\mathbb{R}) \mid \det A = 1\}$. Prove that $SL_2(\mathbb{R})$ is a normal subgroup of $GL_2(\mathbb{R})$~~
        ~~(with respect to matrix multiplication). You may freely use theorems from linear algebra.~~

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WRITING ASSIGNMENTS

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On writing assignments, part of your grade will reflect the quality of your ***style***. Style includes everything
from the basic mechanics of writing (complete, grammatically correct sentences with capitalization and
proper punctuation) to the conventions of writing mathematics developed in Linear Algebra.

Writing Assignment #11   **due Friday, May 01** ~~due Wednesday, April 29~~
    Ch. 21: #28
    AP #1: Let H be a subgroup of S_5 such that H contains a transposition, and $|H|$ is divisible by 5. Prove
        that $H = S_5$. *Hint: you can freely use Cauchy's theorem, see Proposition 22.9.*

Extra Credit: Define $SL_n(\mathbb{R}) := \{A \in GL_n(\mathbb{R}) \mid \det A = 1\}$, and note that $SL_n(\mathbb{R})$ is a subgroup of $GL_n(\mathbb{R})$.
        Concisely describe the left cosets of $SL_n(\mathbb{R})$ in $GL_n(\mathbb{R})$.