

3. MATH 30A, FALL 2009  
HOMEWORK 3

Due: Thursday, Sept 17, at noon (in class).

Homework counts 50% of your grade. Late homework will incur a penalty.

When the problem is computational, show the steps you used to get your answer. Write answers in complete sentences. The odd numbered problems in HW3 are there to help you with the even numbered problems. They are not required and they won't be graded. But if you have a question or comment about them, feel free to show us what you have.

**3.1. Problems from section 2.** Page 26, numbers 7<sup>1</sup>, **8, 10**, 17, **18**, 27, **28**. Hand in the *even numbered problems only*.

**3.2. Problems from section 3.** Page 34, numbers **6, 7, 16**, 17, **26**, 27<sup>2</sup> Hand in the *even numbered problems only*

**3.3. Problems from section 4.** Page 45, numbers 17, **18**, 35, **32**, **22**. Hand in the *even numbered problems only*

Key words/concepts: Isomorphism, homomorphism property, inverse, cancellation, closure.

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<sup>1</sup>The answer to 2.7 in the back of the book is not a complete sentence! I object!

<sup>2</sup>Answer to 3.27:  $\psi \circ \phi(x * y) =_1 \psi(\phi(x * y)) =_2 \psi(\phi(x) * \phi(y)) =_3 \psi(\phi(x)) * \psi(\phi(y)) =_4 (\psi \circ \phi)(x) * (\psi \circ \phi)(y)$  where (1) and (4) hold by definition of  $\psi \circ \phi$ , (2) holds since  $\phi$  is an isomorphism and (3) holds since  $\psi$  is an isomorphism.