Mathematics 216
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Homework 24
Due April 2, 2012

1. Consider the function $f : \mathbf{Z}/5\mathbf{Z} \to \mathbf{R}$ defined by the formula $f([n]_5) = \sin(n\pi)$. Is this function well-defined?

2. Let n be a positive integer. Show that the function $f : \mathbf{Z}/3^n\mathbf{Z} \to \mathbf{Z}/3^{n+1}\mathbf{Z}$ defined by $f([x]_{3^n}) = [x^3]_{3^{n+1}}$ is well-defined.

3. What is the remainder when 10^{400} is divided by 17?