

Math 206, Fall 2024 — Homework 3

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Due September 27 at 5:00 pm

Instructions. This problem set contains problems from Week 3 of class. The problem numbers refer to our textbook, *Reading, Writing, and Proving* by Ulrich Daepf and Pam Gorkin.

Problem 1. Do the following textbook problems: Problems 5.10 (cite your work in Problem 3 below), 5.13 (remember what the range of the sine function is), 6.2, 6.5, 6.12

Problem 2. Write up a full proof of the triangle inequality using your work from [Problem 1 of the Day 6 worksheet](#).

Problem 3. It is a standard fact that an integer n is not divisible by 3 if and only if it can be written in the form $n = 3k + 1$ or $n = 3k + 2$ for some integer k . Use this fact to prove that if n^2 is divisible by 3, then n is divisible by 3.

Problem 4. Prove that if $|x - 2| \leq 1$ then $|x^4 - 16| \leq 65$.