

MATH 1200 (SECTION E): HOMEWORK 3

DUE DATE: NOVEMBER 8 AT THE BEGINNING OF THE LECTURE

1. Prove the following by Contradiction.

(a) If x and y are rational, then $x + y$ is rational.

(b) If x is rational and y is irrational, then $x + y$ is irrational.

2. Prove that $\sqrt{2}$ is irrational.

3. Prove the following statement by three methods: direct proof, contrapositive, and contradiction.

If $5m + 3n$ is even, then either both m and n are even or both m and n are odd.

Hint for direct proof. Remember how we prove that if $7x + 9$ is even, then x is odd.