MATH 201 HW 9 - section B, 11am

due **Mar 25** before class.

Staple all your papers. Write carefully, unreadable answers will not receive any credit. Write your opinion about every question - good - bad - ugly - (or some other) and difficulty.

Please write your section or time of your class on you HW.

1: For the following sentence, write it in symbolic logic, then negate it and write it as an English sentence.

For every polynomial function p_1 of degree at most 7, there exists a polynomial function p_2 of degree at most 5 such that $p_1(x) > p_2(x)$ for all positive x.
(This question is: good - bad - ugly? Difficulty: 0-9:)

2: Prove by contradiction that $\sqrt{7}$ is irrational.
(This question is: good - bad - ugly? Difficulty: 0-9:)

3: Given an integer a, then $a^2 + 4a + 5$ is odd if and only if a is even.
(This question is: good - bad - ugly? Difficulty: 0-9:)

4: Let A and B be sets. Prove without using Venn diagrams that $A \subseteq B$ if and only if $A \cap B = A$.
(This question is: good - bad - ugly? Difficulty: 0-9:)

5: Prove or disprove it: There exist prime numbers p and q for which $p - q = 33$.
(This question is: good - bad - ugly? Difficulty: 0-9:)

6: Let $A \subset \mathbb{N}$ have 2^n elements. Show that there exists $B \subset A$, where B has at most 2^{n-1} elements and the sum of all elements in B is divisible by 2^{n-1}.
(Hint: Induction on n.)
(This question is: good - bad - ugly? Difficulty: 0-9:)