Math 2534   Proofs   in class sheet 2  F2013

Theorems:

1) The sum of any even integer and any odd integer is odd.

2) The product of any two odd integers is odd.

3) For \( n > 2 \), if \( n \) is a prime integer then \( n \) is odd.

4) For all integers \( a, b, c \), if \( a \mid bc \), then \( a \mid b \).

5) Any two consecutive integers have opposite parity.

6) The product of any two consecutive integers is even.

7) For all integers, \( a, b, c \), if \( a \mid b \) and \( a \mid c \), then \( a \mid 2c + 3b \).

8) If \( n \) is a natural number then \( n^3 - n \) is even.

9) Given an integer \( n \), if \( n \) is even, then \( 7n + 4 \) is even.

10) If \( a, b, \) and \( c \) are prime numbers greater than 2, then \( a^3 + b^3 \neq c^3 \).

11) The product of a rational number and an irrational number is irrational.

12) An integer \( n \) is even iff \( n^2 \) is even.

13) The \( \sqrt{2} \) is irrational.

14) For any two integers \( a, b \), the product \( ab \) is odd iff \( a \) and \( b \) are both odd.