

640:300 WORKSHOP 3
QUANTIFIERS AND NEGATIONS

Write in symbolic language and negate each statement. Determine if each statement is true or false by giving a proof or counterexample. You can use the symbols \mathbb{Z} , $\mathbb{Z}_{>2}$, \mathbb{N} , \mathbb{P} , etc.

- (1) There is an integer greater than two that is not a sum of two primes.
- (2) There is a prime that is one more than a multiple of 4 and is also a sum of two squares.
- (3) For any natural number n , there is a natural number s that is the product of n with itself.
- (4) There is a natural number s such that for any natural number n , s is the product of n with itself.

In case you have some spare time, what do you think about the following “variation” of (1):

“There is an even integer greater than two that is not a sum of two primes.” ?