

Name: \_\_\_\_\_

**MA 3520: Quiz 2**

Type all solutions. Your answers should be complete and in proper English.

- (1) Let  $a \in \mathbb{Z}$ . Show if  $a$  is even then  $a^2$  is even.
- (2) Let  $a \in \mathbb{Z}$ . Show if  $a^3 + a^2 + a + 1$  is odd then  $a$  is odd.
- (3) Let  $n \in \mathbb{N}$ . Show if  $n$  is prime then  $n = 2$  or  $n$  is odd (Use proof format  $p \implies q \vee r \equiv p \wedge \neg q \implies r$ ).
- (4) Let  $n \in \mathbb{N}$ . Show if  $n$  is prime then  $n = 2$  or  $n$  is odd. (Use cases).
- (5) Let  $A, B \subseteq S$ . Prove  $A \setminus (A \cap B) = (A \cup B) \setminus B$ .