

Quiz 3 Honors

Name: _____

Math 311H: Fall 2018

1. (1 point) **T** True or False: A monotone sequence of real numbers is convergent if and only if it is bounded.
2. (1 point) **F** True or False: If $a_n \rightarrow a$, and $b_n \rightarrow b$, then $\frac{a_n}{b_n} \rightarrow \frac{a}{b}$.
3. (1 point) **F** True or False: If $a_n + b_n \rightarrow a + b$, then $a_n \rightarrow a$ and $b_n \rightarrow b$.
4. (1 point) Fill in the blanks in the statement of the Bolzano-Weierstrass Theorem below:

“Every _____, _____ set of real numbers has at least one accumulation point.”

Solution: Every **bounded, infinite** set of real numbers has at least one accumulation point.

5. (1 point) Determine the error in the following argument:

Question 1. *Is it true that there exists an even prime number? Prove your answer.*

Proof. No, it is not true. A counterexample would be 3, since 3 is prime but not even. $\square$

Solution: To disprove an existential statement, one must prove a universal statement. A counterexample will not suffice.