

Math 325. Quiz #3

(1) State the **completeness axiom**.

(2) *True or false*, and *justify* with a short proof or example:

If S is a nonempty bounded above set of real numbers, then $\sup(S) \in S$.

(3) *True or false*, and *justify* with a short proof or example:

There is an open interval (a, b) that *only* contains irrational numbers.

Bonus: *True or false*, and *justify*¹ with a short proof or example:

There is a rational number $r \in \mathbb{Q}$ such that $|r^2 - 3| < \frac{1}{1000000}$.

¹You can cite any facts we proved in class or on the homework, but not things we haven't, like decimal expansions