Mathematics 3A03 Real Analysis I
Fall 2019 ASSIGNMENT 6

This assignment is **due** on **Tuesday 3 December 2019 at 2:25pm**.
PLEASE NOTE that you must **submit online** via crowdmark.
You will receive an e-mail from crowdmark with the required link.
Do **NOT** submit a hardcopy of this assignment.

Note: Not all questions will be marked. The questions to be marked will be determined after the assignment is due.

THIS IS A DRAFT VERSION OF THE ASSIGNMENT. THE FINAL VERSION OF THE ASSIGNMENT WILL BE POSTED AS SOON AS IT IS READY. – DE

1. Recall from class that we defined a ***real number*** to be a subset $\alpha \subseteq \mathbb{Q}$ with the following four properties:

    1. $\forall x \in \alpha$, if $y \in \mathbb{Q}$ and $y < x$, then $y \in \alpha$;
    2. $\alpha \neq \varnothing$;
    3. $\alpha \neq \mathbb{Q}$;
    4. there is no greatest element in α: $\forall x \in \alpha$, $\exists y \in \alpha$ so that $y > x$.

    Assume α and β are real numbers, and define their ***sum*** $\alpha + \beta$ to be

    $$\alpha + \beta = \{a + b \mid a \in \alpha, b \in \beta\}.$$

    Use the formal definition above to show that $\alpha + \beta$ is a real number.

Version of November 26, 2019 @ 22:59