Source: ⟦KBe⟧ -2020math520-index

- Discussion Results: what is a number?
    - Something about group theory
        - This is more like a way of telling us how to use numbers, not really a good definition.
        - Set up bounds to define things
    - Different classes (natural, real, imaginary)
    - Where do you draw the boundaries between objects?
    - A way to quantify the nature of living and reality

- Number Systems
    - We want them to be desirable and group-like
    - Types
        - **Natural Numbers**
            - Integers greater than zero
        - Whole Numbers
            - Natural Numbers + 0
            - 0 is the hole.
        - Integers
            - { …, -2, -1, 0, 1, 2, … }
            - Good for algebra, we'll see later
        - Rationals
            - Like $\frac{1}{2}$.
            - A ratio/fraction/quotient of integers
        - **Real**
            - Like π
            - A number on the number line
                - A number that can be a distance to something.
                - A good enough definition that isn't "real analysis"
        - **Complex Numbers**
            - Like $5i$
            - There will be many complex numbers
                - Matrices with complex numbers can be different from real numbers
            - Complex plane
        - Hamaltonian numbers music video? #curiosity
    - Why do we want more numbers?
        - Why Zero?
            - Additive identity
                - Zero vector = identity vector
                - Frame of reference, starting point, nice and neutral
        - Zintegers?
            - Why negatives?
                - So you can make zero
                - Undo each other, undo a $+5$
                - Inverse
                    - $-a$ and a are additive *inverses*
    - That's all we need to get to a group: ⟦KBe⟧-2020math520-flo-groups

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