Worksheet 3

Monday, October 14, 2019

Math 205

1. You have been assigned into groups of three for the week. Write down your colleagues' names and email addresses.

2. Last week, many of you remarked that algebra would work better if we let $\infty + 1$ be different from ∞, and 2∞ different from both of those, and so on. If we want the operations $+$, $-$, $\times$, $\div$ to work according to their usual rules, we'll quickly face a profusion of expressions like

$$5\infty - 1,\ \frac{1}{\infty},\ \frac{1}{\infty - 1},\ \frac{1}{2\infty + 1},\ \frac{2\infty}{\infty - 1},\ \frac{4\infty^2}{\infty + 3}, \ldots$$

   Try to put the expressions above in order: which should be less than which?

3. List some increasingly complicated expressions like this. (Just use the four basic operations, don't worry about 2^∞ or $\log \infty$ or anything like that.) Put your expressions in order.

4. Can you explain in general, if someone gives you any two elements of this number system, how to decide which one is greater?