Math 5710 Tuesday, 6/23/20 Quiz 02

1. What is your name?

2. Write two sentences that explain why the following proposition is true:

$$V = \mathbb{R} \wedge i^2 = {}^{-}1 \Rightarrow \{\, 4 - 0.33i\,,\, \sqrt[4]{-17.1}\,\} = \varnothing$$

Since $V = \mathbb{R}$, no imaginary numbers exist in our universe. $\{\, 4 - 0.33i\,,\, \sqrt[4]{-17.1}\,\}$ contain exactly two elements and they are both imaginary numbers which do not exist under the specified universe defined herein.

3. Write two sentences that explain why the following proposition is true:

$$V = \mathbb{C} \wedge i^2 = {}^{-}1 \Rightarrow \{\, 4 - 0.33i\,,\, \sqrt[4]{-17.1}\,\} \neq \varnothing$$

Since $V = \mathbb{C}$ and $\mathbb{C} = \mathbb{R} \cup \{$ imaginary numbers $\}$, $\{\, 4 - 0.33i\,,\, \sqrt[4]{-17.1}\,\} \neq \varnothing$. Both elements of this set are imaginary numbers, thus $4 - 0.33i\,,\, \sqrt[4]{-17.1} \in \mathbb{C}$.

4. Write two sentences that explain why the following proposition is true:

Given that $V = \{$ everything $\}$, the following set has exactly 5 elements:

$\{\, 1 + 2,\ \sqrt{9}\,,\ 9^{1/2}\,,\ 0,\ \mathbb{R},\ \text{“3”},\ \varnothing\,\}$

$1 + 2 = \sqrt{9} = 9^{1/2} = 3$. So we have redundancies in the listing. Those three listings, lists only one element, namely 3; on the other hand, there are four other distinct elements in the set: the number zero, the set of all real numbers, a name for the number three (which is not the number three), and finally the empty. That gives us five distinct elements in the set - no more, not less.

5. Smile.