Compute the cardinality:

$$|\{1,2,3,4,5\} \cup \{3,4,5,6\}|$$

$$|[0,\pi) \cap \mathbb{Z}|$$

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Which are disjoint?

$\mathbb{Z}$ and $\mathbb{R}$

$\mathbb{Z}$ and $\mathbb{R}^-$

$[0, 5)$ and $[5, 10)$

Plants and *Fungi*

MathClasses and *CSCIClasses*

DeciduousTrees and *ConiferousTrees*

1.8.1 What is the cardinality of $\{0, 1, 2, \ldots n\}$?

1.8.3 One might be tempted to think $|A \cup B| = |A| + |B|$, but this is not true in general. Why not? (Assume A and B are finite.)

1.8.6 Describe three distinct partitions of the set $\mathbb{Z}$.

1.9.5 Based on our description of the real number plane as a Cartesian product, explain how a line can be interpreted as a set.

1.9.6 Explain how $\mathbb{C}$, the set of complex numbers, can be thought of as a Cartesian product.

1.9.7 Any rational number (an element of set $\mathbb{Q}$) has two integers as components. Why not rewrite fractions as ordered pairs (for example, $\frac{1}{2}$ as $(1,2)$ and $\frac{3}{4}$ as $(3,4)$) and claim that $\mathbb{Q}$ can be thought of as $\mathbb{Z} \times \mathbb{Z}$? Explain why these two sets *cannot* be thought of as two different ways to write the same set. (There are at least two reasons.)