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Name:

The symbol for the rational numbers is \mathbb{Q} while the symbol for the irrational numbers is $\mathbb{R} \setminus \mathbb{Q}$.
So you can express that x is an irrational number by $x \notin \mathbb{Q}$ or by $x \in \mathbb{R} \setminus \mathbb{Q}$.
Recall for any sets R and Q , the set R set minus Q is the set $R \setminus Q \stackrel{\text{def.}}{=} \{x \in R : x \notin Q\}$.
Note the difference in direction in the slash for set minus ($R \setminus Q$) and quotient of numbers ($1/2 = 0.5$).

A symbol for the positive real numbers is $\mathbb{R}^{>0}$ where $\mathbb{R}^{>0} = \{x \in \mathbb{R} : x > 0\}$.
You may use the fact we showed in class that if p is a prime then \sqrt{p} is irrational.

►. **Conjecture C.** For every pair of real numbers x and y , if $x + y$ is irrational, then x is irrational and y is irrational.

1. Symbolically write Conjecture C.
2. State whether Conjecture C is true or false.
3. Justify your answer to the previous part. You should understand that this means the following. If Conjecture C is true, then provide a proof of Conjecture C. If Conjecture C is false, then provide a counterexample and clearly explain why the counterexample is indeed a counterexample.

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