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1. To become a teacher
2. Volleyball
3. a number that can be represented as a fraction
4. let $a, b, c, d \in \mathbb{Z}$, then $\frac{a}{b} + \frac{c}{d} = \frac{ad+cb}{bd}$

5. counter example: $(3 + 7\sqrt{10}) + (-7\sqrt{10}) = 3$
which is a rational number.

6. Do the contradiction. Assume there are a finite number of primes $p_1, p_2, p_3, \dots, p_n$ then the next number is either a prime or not. If it is then there's the contradiction. If not then we keep going until we hit a prime

7. Do the contradiction. let $\sqrt{5}$ be a rational number such that $\sqrt{5} = \frac{p}{q}$ for some $p, q \in \mathbb{Z}$ and p and q have no common factors then $5 = \frac{p^2}{q^2}$ which implies $p^2 = 5q^2$. By Euclid's lemma, since 5 is prime $5|p$ but we said that p and q have no common factors so that leads to a contradiction that $5|p$. Thus $\sqrt{5}$ is irrational