

We saw Examples 19 to 24 this week in the lectures and office hours.

- **Example 25:** prove or disprove that for many values of $n \in \mathbb{N}$, $n = 3a + 5b$ where $a, b \in \mathbb{Z}$.
- **Example 26:** using strong induction, prove that if one, two, or three trees of a forest catch fire and if the heat can fire three more trees, then all trees can catch fire.
- **Example 26':** using simple induction, prove that if one, two, or three trees of a forest catch fire and if the heat can fire three more trees, then all trees can catch fire.
- **Example 27:** make a conjecture on the number of binary strings length n that do not contain substring "00"; then prove it.
- **Example 27':** make a conjecture on the number of binary strings length n that do not contain substring "000"; then prove it.

Always, do some scratch work first to verify if the claim makes sense or not. If it does, prove it. If it does not, you probably have a counter example already.