Directions. Please submit your answer to the following problem in a LaTeX-prepared document. Class participants are encouraged to prepare solutions in a collaborative mode but to prepare their to-be-submitted write-ups individually. The consequences of sharing files, electronic or otherwise, are discussed in the course syllabus.\footnote{If the wording of this problem was discussed in detail in the classroom, the course instructor expects to see similar phrases and sentences in reading the submissions.}

Please include the problem number along with a statement of the problem in your submission. Please also include your e-mail address.

Recall that an even integer is an integer that can be written in the form $2n$ where $n \in \mathbb{Z}$ and an odd integer is an integer that can be written in the form $2n + 1$ where $n \in \mathbb{Z}$.

**Problem.** Prove that an integer cannot be both even and odd. (Here we use the symbol 2 to denote the real number $1+1$.)