

Justify all answers!

(8 pts)

(1) [+8] Let $x \in \mathbb{R}$ have the property that $x + \frac{1}{x} \in \mathbb{Z}$. Prove that $x^n + \frac{1}{x^n} \in \mathbb{Z}$ for all $n \in \mathbb{Z}$. (Hint: first prove it for $n \in \mathbb{N} \cup \{0\}$ and then extend to all of \mathbb{Z})