

Math 3283 - Foundations of Mathematics

Exam #2 - 2021.10.25

Name: _____

1. Prove or disprove: $\forall n \in \mathbb{Z} \ 3n^2 - 5n + 6$ is even.
2. Prove or disprove: $\forall n \geq 3, n \in \mathbb{Z}$ if n is prime, then $n + 1$ is not prime.
3. Prove $\forall n \geq 2, n \in \mathbb{Z}, \prod_{k=2}^n \frac{k-1}{k+1} = \frac{2}{n(n+1)}$.
4. Prove $\forall n, m, l \in \mathbb{Z}$, if $n \mid m + l$ and $n \mid m$, then $n \mid l$.
5. Prove $\forall m \in \mathbb{Z}, m$ is odd iff $4m^2 - 5m + 2$ is odd.