MATH310 Homework 2022-07-19
Due Gradescope 11:59pm 2022-07-21

1. Prove that for any integers a and b if a divides b and b divides a then $a = \pm b$. [20 pts]

2. Prove $\forall x \in \mathbb{R}$ that $x^2 + x - 12 = 0$ iff $x = 3$ or $x = -4$. [20 pts]

3. Prove there exists a function $f(x)$ with $f'(x) = 4x$ and $f(2) = 3$. [20 pts]

4. Prove by cases that $\forall n \in \mathbb{Z}$ we have $n^2 + n + 1$ odd. [20 pts]

5. Prove $\forall n \in \{5, 6, 7, 9\}$ if n is not prime then $n = 3k$ for some $k \in \mathbb{Z}$. [20 pts]