MAT-255– Number Theory Spring 2024 In Class Work January 17

Your Name: _____ Group Members: _____ _____

In-class Problem 1 Prove

Theorem 1 (Ernst, Theorem 2.2). If n is an even integer, then n^2 is even.

Solution: If n is an even integer, then by definition, there is some $k \in \mathbb{Z}$ such that $n = 2k$. Then

$$n^2 = (2k)^2 = 2(2k^2).$$

Since $2(k^2)$ is an integer, we have written n^2 in the desired form. Thus, n^2 is even.

In-class Problem 2 Prove

Theorem 2 (Strayer, Proposition 1.2). Let $a, b, c, m, n \in \mathbb{Z}$. If $c \mid a$ and $c \mid b$ then $c \mid ma + nb$.

Learning outcomes:
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