Proof Homework

Parker Whaley

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Theorem.
If a is a non zero integer then $a|a$.
Proof.
Assume a is some non zero integer. Since one is the multiplicative identity we can say $1 \cdot a = a$. Note that one is an integer. Thus by definition $a|a$.
□

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Theorem.
If a, b, and c are non zero integers such that $a|b$ and $b|c$, then $a|c$
Proof.
Suppose a, b, and c are non zero integers such that $a|b$ and $b|c$. By definition $a \cdot m = b$ for some integer m. By definition $b \cdot n = c$ for some integer n. Note that $a \cdot m \cdot n = c$. Also note that the multiple of two in integers is a integer thus $m \cdot n$ is a integer. By definition $a|c$.
□