Proof HW

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Theorem.
If m and n are relatively prime and both divide k then k is divisible by mn.
Proof.
Suppose m and n are relatively prime and both divide k.
By definition of divides note that there exist a i and l such that $im = k$ and $ln = k$. Since m and n are relatively prime we can say by definition that there exist $a, b \in \mathbb{Z}$ such that $am + bn = 1$. Note that $am + bn = 1 \Rightarrow kam + kbn = k1 \Rightarrow (ln)am + (im)bn = k \Rightarrow (la + ib)mn = k$ noting that $la + ib$ is a integer we may say by definition $mn|k$.
□