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4.  $a|n, b|n, \gcd(a, b) = 1 \rightarrow$  Prove  $ab|n$

By Bezout's Lemma,

$as + bt = 1$  for some  $s, t \in \mathbb{Z} \rightarrow$  Multiply by  $n \rightarrow asn + btn = n$

We can say that  $n = bk, n = aj$  for some  $k, j \in \mathbb{Z}$ , as  $n|a, b$

$bkas + ajbt = n \rightarrow ab(ks + jt) = n \rightarrow$

$(ks + jt) \in \mathbb{Z}$ . This means that  $ab|n$ .