THEOREM 4.3.1: For all positive integers a and b,

if $a \mid b$, then $a \leq b$.

Proof: Let a and b be positive integers.
Suppose $a \mid b$. [N.T.S. $a \leq b$]
$\therefore$ For some integer k, $b = ak$, by definition of "divides".

Since $ak = b$, $k = \frac{b}{a}$ by Rules of Algebra.

Since $a > 0$ and $b > 0$, $k = \frac{b}{a} > 0$, by R.O.A.

Since $k > 0$ and k is an integer, $k \geq 1$.
So, $1 \leq k$.

$\therefore$ $a \cdot 1 \leq ak$, by ROA.

Since $ak = b$ and $a \cdot 1 = a$, $a \leq b$, by substitution.

$\therefore$ For all positive integers a and b, if $a \mid b$, then $a \leq b$, by Direct Proof.

QED.

Be able to cite Theorem 4.3.1 by Name, as in

"Since r and s are positive integers and $r \mid s$, then $r \leq s$, by Theorem 4.3.1."