$a\%n = b\%n$ if and only if $a \equiv b (mod\ n)$

Show the forward direction:

If $a\%n = b\%n$ then $a \equiv b (mod\ n)$.

This proof is a bit different than the other direction.

Remember to work from top and bottom!!

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Equivalence in modular arithmetic

Let $a \in \mathbb{Z}, b \in \mathbb{Z}, n \in \mathbb{Z}$ and $n > 0$.
We say $a \equiv b\ (mod\ n)$ if and only if $n|(b - a)$

The Division Theorem

For every $a \in \mathbb{Z}$, $\boldsymbol{d} \in \mathbb{Z}$ with $\boldsymbol{d > 0}$
There exist *unique* integers q, r with $0 \leq r < d$ Such that $a = dq + r$