$(l_1, \mu | n_1)$ & $(l_2, \mu | n_2)$ s.t. $l_1 n_1 = l_2 n_2$

$\uparrow$ h', h'' $\qquad\qquad$ $\uparrow$ k', k''

Assume $\mu(1; h'')\mu(h'; 1) = \mu(1; k'')\mu(k'; 1)$.
Consider the preimages of $\{1, \dots, ln\}$.
$\mu(-; 1)(\{1, \dots, ln\}) = \{1, \dots, ln\}$, so the preimage is given by the preimages of
$f = \mu(h'; 1)$ & $g = \mu(k'; 1)$
using $\{1, \dots, ln\}$.

$$f^{-1}(\{1, \dots, ln\}) = \{ l_1 \cdot \pi(h'')^{-1}(1), -1, -2, \dots, -(l_1 - 1) \\ \vdots \\ l_1 \cdot \pi(h'')^{-1}(n_1), -1, -2, \dots, -(l_1-1)\}$$

$$g^{-1}(\{1, \dots, ln\}) = \{ l_2 \cdot \pi(k'')^{-1}(1), -1, \dots, -(l_2 - 1) \\ \vdots \\ l_2 \cdot \pi(k'')^{-1}(n_2), -1, \dots, -(l_2-1)\}$$

n_1 blocks of l_1 adjacent #s in f^{-1}
n_2 blocks of l_2 adjacent #s in g^{-1}

If $l_1 = l_2$, done.
If $l_1 \neq l_2$, $\{1, \dots, l_1\} \neq \{1, \dots, l_2\}$
Need $\{1, \dots, \alpha_1 l_1\} = \{1, \dots, \alpha_2 l_2\}$
Claim: $f(\{1, \dots, \alpha_1 l_1\}) = \{1, \dots, \alpha_1 l_1\}$
Idea: use "overlapping" blocks from f & g until we get to $\alpha_1 l_1 = \alpha_2 l_2$
Claim #2: If $f(\{1, \dots, k\}) = \{1, \dots, k\}$ then $k = 1$ or $k =$ end
Still need $\alpha_1 l_1$ is not the end: true b/c $\alpha_1 l_1 \leq l_1 n_1 < l m n$ if $m > 1$.