Detailed Balance

If $$\pi(x)T(x \to x') = \pi(x')T(x' \to x)$$

Then $$\pi(x') = \sum_x \pi(x)T(x \to x')$$

Proof
$$\begin{aligned}\sum_x \pi(x)T(x \to x') &= \sum_x \pi(x')T(x' \to x) \\ &= \pi(x') \sum_x T(x' \to x) \\ &= \pi(x')\end{aligned}$$