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CS311
Proof of towers of Hanoi

You may type or handwrite your answers. If it is not legible, you will not receive credit.

Recall for the towers of Hanoi problem, $T(n) = 2^n - 1$ [theorem]   where $T(n)$ is the amount of work needed to move n disks.

We came up with the above theorem by guessing using a table and also solving the recurrence relation.

Recall the recurrence relation was
$T(1) = 1$
$T(n) = 2T(n-1) + 1$ where $n >= 2$

<Question>
Prove that the theorem is true using PMI (proof by induction).
HINT: Use the recurrence relation somewhere in your proof.