2	modus ponens	3, 4	$t \in \mathbb{N}^{+} \vdash \forall_{t \in \mathbb{N}^{+}} \left(\left|\psi_{t}\right\rangle = \left(\frac{1}{2^{\frac{t}{2}}} \cdot \left(\sum_{k=0}^{2^{t}-1} \left(e^{2 \cdot \pi \cdot i \cdot \varphi \cdot k} \cdot \left|k\right\rangle_{t}\right)\right)\right)\right)$

Show the Proof

In [1]:

```python
import proveit
# Automation is not needed when only showing a stored proof:
proveit.defaults.automation = False # This will speed things up.
proveit.defaults.inline_pngs = False # Makes files smaller.
%show_proof
```

Out[1]:

	step type	requirements	statement
0	modus ponens	1, 2	$t \in \mathbb{N}^{+} \vdash \forall_{t \in \mathbb{N}^{+}} \left(\left|\psi_{t}\right\rangle = \left(\frac{1}{2^{\frac{t}{2}}} \cdot \left(\sum_{k=0}^{2^{t}-1} \left(e^{2 \cdot \pi \cdot i \cdot \varphi \cdot k} \cdot \left|k\right\rangle_{t}\right)\right)\right)\right)$
1	instantiation	3, 4*, 5*, 433*	$t \in \mathbb{N}^{+} \vdash \left(\left(\left|\psi_{1}\right\rangle = \left(\frac{1}{\sqrt{2}} \cdot \left(\sum_{k=0}^{1} \left(e^{2 \cdot \pi \cdot i \cdot \varphi \cdot k} \cdot \left|k\right\rangle\right)\right)\right)\right) \land \left[\forall_{t \in \mathbb{N}^{+}~|~\left|\psi_{t}\right\rangle = \left(\frac{1}{2^{\frac{t}{2}}} \cdot \left(\sum_{k=0}^{2^{t}-1} \left(e^{2 \cdot \pi \cdot i \cdot \varphi \cdot k} \cdot \left|k\right\rangle_{t}\right)\right)\right)} \left(\left|\psi_{t+1}\right\rangle = \left(\frac{1}{2^{\frac{t+1}{2}}} \cdot \left(\sum_{k=0}^{\left(2 \cdot 2^{t}\right)-1} \left(e^{2 \cdot \pi \cdot i \cdot \varphi \cdot k} \cdot \left|k\right\rangle_{t+1}\right)\right)\right)\right)\right]\right) \Rightarrow \left[\forall_{t \in \mathbb{N}^{+}} \left(\left|\psi_{t}\right\rangle = \left(\frac{1}{2^{\frac{t}{2}}} \cdot \left(\sum_{k=0}^{2^{t}-1} \left(e^{2 \cdot \pi \cdot i \cdot \varphi \cdot k} \cdot \left|k\right\rangle_{t}\right)\right)\right)\right)\right]$
	$P(t) : \left|\psi_{t}\right\rangle = \left(\frac{1}{2^{\frac{t}{2}}} \cdot \left(\sum_{k=0}^{2^{t}-1} \left(e^{2 \cdot \pi \cdot i \cdot \varphi \cdot k} \cdot \left|k\right\rangle_{t}\right)\right)\right)$, $m : t$, $n : t$		
2	instantiation	6, 7, 8	$\vdash \left(\left|\psi_{1}\right\rangle = \left(\frac{1}{\sqrt{2}} \cdot \left(\sum_{k=0}^{1} \left(e^{2 \cdot \pi \cdot i \cdot \varphi \cdot k} \cdot \left|k\right\rangle\right)\right)\right)\right) \land \left[\forall_{t \in \mathbb{N}^{+}~|~\left|\psi_{t}\right\rangle = \left(\frac{1}{2^{\frac{t}{2}}} \cdot \left(\sum_{k=0}^{2^{t}-1} \left(e^{2 \cdot \pi \cdot i \cdot \varphi \cdot k} \cdot \left|k\right\rangle_{t}\right)\right)\right)} \left(\left|\psi_{t+1}\right\rangle = \left(\frac{1}{2^{\frac{t+1}{2}}} \cdot \left(\sum_{k=0}^{\left(2 \cdot 2^{t}\right)-1} \left(e^{2 \cdot \pi \cdot i \cdot \varphi \cdot k} \cdot \left|k\right\rangle_{t+1}\right)\right)\right)\right)\right]$
	$A : \left|\psi_{1}\right\rangle = \left(\frac{1}{\sqrt{2}} \cdot \left(\sum_{k=0}^{1} \left(e^{2 \cdot \pi \cdot i \cdot \varphi \cdot k} \cdot \left|k\right\rangle\right)\right)\right)$, $B : \forall_{t \in \mathbb{N}^{+}~|~\left|\psi_{t}\right\rangle = \left(\frac{1}{2^{\frac{t}{2}}} \cdot \left(\sum_{k=0}^{2^{t}-1} \left(e^{2 \cdot \pi \cdot i \cdot \varphi \cdot k} \cdot \left|k\right\rangle_{t}\right)\right)\right)} \left(\left|\psi_{t+1}\right\rangle = \left(\frac{1}{2^{\frac{t+1}{2}}} \cdot \left(\sum_{k=0}^{\left(2 \cdot 2^{t}\right)-1} \left(e^{2 \cdot \pi \cdot i \cdot \varphi \cdot k} \cdot \left|k\right\rangle_{t+1}\right)\right)\right)\right)$		
3	theorem		$\vdash \forall_{P} \left(\left(P(1) \land \left[\forall_{m \in \mathbb{N}^{+}~|~P(m)} P(m+1)\right]\right) \Rightarrow \left[\forall_{n \in \mathbb{N}^{+}} P(n)\right]\right)$
	proveit.numbers.number_sets.natural_numbers.fold_forall_natural_pos		