## So Far We Have Only Assigned Truth Values to Atomic Formulas

How can we assign truth values to more complex formulas?

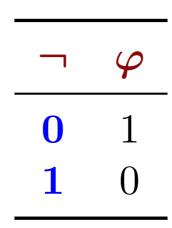
## Extending V for Negation

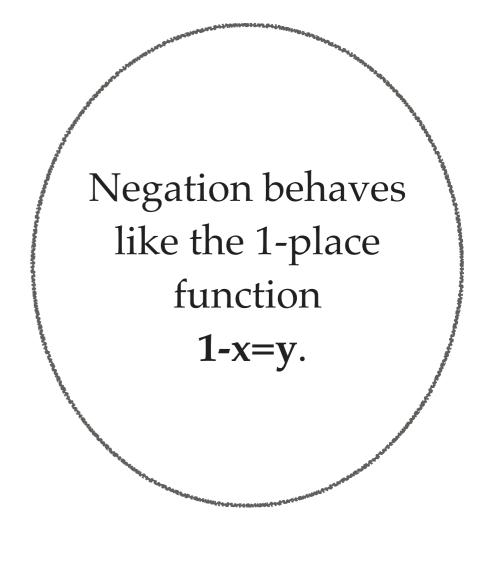
Use 1 for true, and 0 for false.

For **negation**  $\neg$ 

 $\begin{array}{c|c}
\varphi & \neg \varphi \\
\hline
1 & \mathbf{0} \\
0 & \mathbf{1}
\end{array}$ 

or, in a shorter format:





## Extending V for Conjunction and Disjunction

For **conjunction**  $\wedge$ 

arphi	$\wedge$	$\psi$
1	1	1
1	0	0
0	0	1
0	0	0

Conjunction
behaves like the 2-place
functions  $(x_1 \cdot x_2) = y$ and  $min(x_1, x_2) = y$ .

For disjunction  $\vee$ 

$\varphi$	V	$\psi$
1	1	1
1	1	0
0	1	1
0	0	0