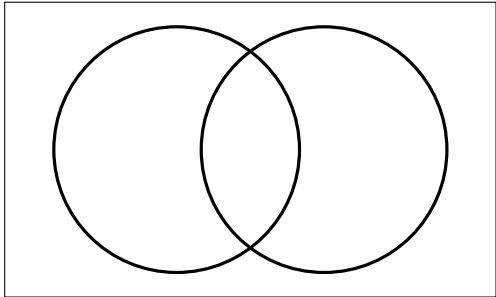


MATH 113: 2/10 WORKSHEET

Semantics means the meaning of words or symbols. To describe the semantics of logical connectives we will use *truth tables*. These tables describe connectives as functions, hence the name “truth-functional logic”. The left side of the table gives the possible truth value combinations for the input, and the right side gives the output truth value. For TFL the only two possible truth values are true (T) and false (F).

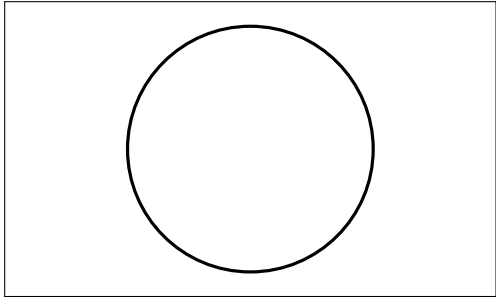
As a visual aid, we will also describe the semantics using *Venn diagrams*. In a Venn diagram the interior of the circles represent when each input is true, and we shade in the regions corresponding to which outputs are true.

P	Q	$P \wedge Q$
T	T	
T	F	
F	T	
F	F	



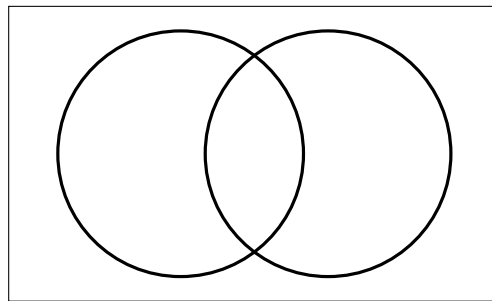
A Venn diagram consisting of two overlapping circles within a rectangular frame. The circles are positioned side-by-side and overlap in the center. No regions are shaded.

P	$\neg P$
T	
F	

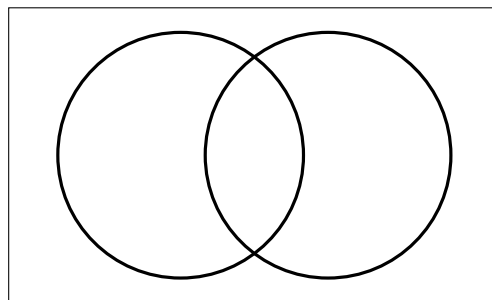


A Venn diagram consisting of a single circle within a rectangular frame. No regions are shaded.

P	Q	$P \vee Q$
T	T	
T	F	
F	T	
F	F	



P	Q	$P \leftrightarrow Q$
T	T	
T	F	
F	T	
F	F	



P	Q	$P \rightarrow Q$
T	T	
T	F	
F	T	
F	F	

