Truth Tables Worksheet **Name: _____**

- **Boolean connectors**

Boolean	Symbol	Vocabulary	Hint	Meaning
And	$\wedge$	Conjunction	Both	Both parts have to be true for conjunction to be true
Or	$\vee$	Disjunction	Either	If either part is true, then the disjunction is true
Not	$\sim$	Negation	Opposite	Changes true to false and false to true

- **Truth Tables**
  - **Only consider the two columns connected by the Boolean connector, cover up the rest of the columns (mentally or physically)**
  - **Use connector meaning (or hint words) to evaluate statement as true or false**
  - **Ask the question are "hint word" true? If yes then true; no, then false**

P	Q	~P	~Q	P∧Q	P∨Q	~P∧Q	P∨~Q	P∧Q ∨ ~Q	P∨Q ∧ ~P
T	T								
T	F								
F	T								
F	F								

- Truth tables govern many physical things we deal with in the world around us; like electricity in houses is governed by truth tables, which ones depends on the electrical circuit being used. Christmas tree lights: if one goes out and they all go out then it is an electrical series circuit – a Boolean *and*; .if one goes out and the others stay on then it is a parallel circuit – a Boolean *or*.

- **Change each of the following statements into symbols.**
  - W: Monday we have a quiz.
  - T: It will rain today.

Statement	Symbols
Monday we have a quiz and it will not rain today.	**W ∧ ~T**
Monday we have a quiz or it will not rain today	
Monday we don't have a quiz or it will rain today	
Monday we have a quiz and it will rain today	

Symbols Worksheet

Boolean	Symbol		Words	Symbol
And	$\wedge$		If .. then	$\rightarrow$
Or	$\vee$		therefore	$\therefore$
Not	$\sim$		If … and only if	$\leftrightarrow$

Many SOL problems ask students to translate from English sentences into symbol statements using the symbols listed above.

Change the following statements from English into symbols:

Let *s* represent
∠X is acute

Let *t* represent
∠Y is acute

English statements

∠X is acute if and only ∠Y is acute
∠X is not acute or ∠Y is not acute
Therefore angle a and ∠Y are not acute

Symbols

s ↔ t
~s ∨ ~t
∴ ~s ∧ ~t

Let *a* represent:
Angle X is obtuse.

Let *b* represent:
Angle Y is obtuse.

English Statements

Angle X is obtuse if and only if Angle Y is obtuse.
Angle X is obtuse or Angle Y is obtuse.
Therefore, Angle X is obtuse and Angle Y is obtuse.

Symbols

Let *j* represent
Sally works this summer.

Let *k* represent
Sally takes a vacation

English statements

If Sally works this summer,
then she will not take a vacation.
Sally works this summer.
Therefore, Sally does not take a vacation.

Symbols
