

Math Sheet

Name _____ Score _____ Teacher _____ Date _____

Digital Logic Truth Tables

Read digital truth tables with 1 for true and 0 for false.

1 = T; 0 = F

NOT

NOT is true exactly when its input is false. Given: NOT p / p'.

$\neg(p)$

p	$\neg(p)$
1	0
0	1

AND

AND is true only when both inputs are true. Given: pq / p·q.

$(p \wedge q)$

p	q	$(p \wedge q)$
1	1	1
1	0	0
0	1	0
0	0	0

OR

OR is true when at least one input is true. Given: p+q.

$(p \vee q)$

p	q	$(p \vee q)$
1	1	1
1	0	1
0	1	1
0	0	0

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NAND

NAND is the negation of AND, so it is false only when both inputs are true.

$$\neg(p \wedge q)$$

p	q	$\neg(p \wedge q)$
1	1	0
1	0	1
0	1	1
0	0	1

NOR

NOR is the negation of OR, so it is true only when both inputs are false.

$$\neg(p \vee q)$$

p	q	$\neg(p \vee q)$
1	1	0
1	0	0
0	1	0
0	0	1

XOR

XOR is true when exactly one input is true.

$$(p \oplus q)$$

p	q	$(p \oplus q)$
1	1	0
1	0	1
0	1	1
0	0	0

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Truth table

1 = T, 0 = F

p	q	$\neg(p)$	$(p \wedge q)$	$(p \vee q)$	$\neg(p \wedge q)$	$\neg(p \vee q)$	$(p \oplus q)$
1	1	0	1	1	0	0	0
1	0	0	0	1	1	0	1
0	1	1	0	1	1	0	1
0	0	1	0	0	1	1	0