

```
In[1]:= BooleanTable[p || q, {p, q}]
```

```
Out[1]= {True, True, True, False}
```

```
In[7]:= f = (x || y) || !x;
```

```
BooleanTable[{x, y} → f, {x, y}]
```

```
Out[8]= {{True, True} → True, {True, False} → True, {False, True} → True, {False, False} → True}
```

```
In[9]:= TableForm[Apply[List, {{True, True} → True, {True, False} → True, {False, True} → True, {False, False} → True}, {1}]]
```

```
Out[9]//TableForm=
  True
  True      True
  True
  False     True
  False
  True      True
  False
  False     True
  False
```

```
In[10]:= TruthTable[op_, n_] := Module[ {l = Flatten[Outer[List, Sequence @@
  Table[{True, False}, {n}]], n - 1], a = Array[A, n] }, DisplayForm[
  GridBox[Prepend[Append[#, op @@ #] & amp; /@ l, Append[a, op @@ a]],
    RowLines → True, ColumnLines → True] ] ]
```

```
A[1] = p;
```

```
A[2] = q;
```

```
In[13]:= TruthTable[Implies[Implies[#2, #1], Or[#1, #2] ] & amp; , 2]
```

```
Out[13]//DisplayForm=
  GridBox[{{p, q, Null[p, q]}, Null[{True, True}], Null[{True, False}], Null[{False, True}], Null[{False, False}]}, RowLines →
    True, ColumnLines → True]
```

```
In[14]:= f = (x && y) || (!z);
```

```
BooleanTable[{x, y, z} → f, {x, y, z}]
```

```
Out[15]= {{True, True, True} → True, {True, True, False} → True, {True, False, True} → False, {True, False, False} → True, {False, True,
```

```
In[43]:= TableForm[Apply[List, %42, {1}]]
```

```
Out[43]//TableForm=
```

True	
True	True
True	
True	
True	True
False	
True	
False	False
True	
True	
True	True
False	
False	
False	
True	False
True	
False	
True	True
False	
False	
False	False
False	
True	
False	True
False	
False	

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```

In[35]:= f = (!x);
BooleanTable[{x} → f, {x}]

Out[36]= {{True} → False, {False} → True}

In[37]:= TableForm[Apply[List, {{True} → False, {False} → True}, {1}]]
Out[37]//TableForm=
  True    False
  False   True

In[38]:= f = P && ( P || Q);
BooleanTable[{P, Q} → f, {P, Q}]

Out[39]= {{True, True} → True, {True, False} → True, {False, True} → False, {False, False} → False}

In[40]:= TableForm[Apply[List, {{True, True} → True, {True, False} → True, {False, True} → False, {False, False} → False}, {1}]]
Out[40]//TableForm=
  True    True
  True
  True    True
  False
  False   False
  True
  False   False
  False

In[41]:= f = (x && y) || (!z);
BooleanTable[{x, y, z} → f, {x, y, z}]

Out[42]= {{True, True, True} → True, {True, True, False} → True, {True, False, True} → False, {True, False, False} → True, {False, True, True} → False, {False, True, False} → True, {False,
  False, True} → False, {False, False, False} → True}

```

```
In[29]:= f = (P && Q) && (! (Q || P));
BooleanTable[{P, Q} → f, {P, Q}]

Out[30]= {{True, True} → False, {True, False} → False, {False, True} → False, {False, False} → False}

In[31]:= TableForm[Apply[List, {{True, True} → False, {True, False} → False, {False, True} → False, {False, False} → False}, {1}]]

Out[31]//TableForm=
  True   False
  True   False
  False  False
  False  False
  False  False
  False  False

In[32]:= f = (!R) || (R && (!H));
BooleanTable[{R, H} → f, {R, H}]

Out[33]= {{True, True} → False, {True, False} → True, {False, True} → True, {False, False} → True}

In[34]:= TableForm[Apply[List, {{True, True} → False, {True, False} → True, {False, True} → True, {False, False} → True}, {1}]]

Out[34]//TableForm=
  True   False
  True   True
  False  True
  False  True
  False  True
  False  True
```

```

In[26]:= f = Implies[P, (Q || R)];
BooleanTable[{P, Q, R} → f, {P, Q, R}]

Out[27]= {{True, True, True} → True, {True, True, False} → True, {True, False, True} → True, {True, False, False} → False, {False, True, True} → True, {False, True, False} → True, {False,
False, True} → True, {False, False, False} → True}

In[28]:= TableForm[Apply[List, %27, {1}]]

Out[28]//TableForm=
  True
  True   True
  True
  True
  True   True
  False
  True
  False  True
  True
  True
  False  False
  False
  False
  False  True
  True
  True
  False  True
  True
  False
  False  True
  True
  False  True
  False
  False

In[29]:= f = (P && Q) && (! (Q || P));
BooleanTable[{P, Q} → f, {P, Q}]

Out[30]= {{True, True} → False, {True, False} → False, {False, True} → False, {False, False} → False}

```

Out[22]//TableForm=

True	True
True	
True	
False	True
False	
True	True
False	True

In[23]= f = (Implies[(!P), R] && Implies[Q, P]) ;
BooleanTable[{P, Q, R} → f, {P, Q, R}]

Out[24]= {{True, True, True} → True, {True, True, False} → True, {True, False, True} → True, {True, False, False} → True, {False, True, True} → False, {False, True, False} → False, {False, False, True} → True, {False, False, False} → False}

In[25]= TableForm[Apply[List, %24, {1}]]

Out[25]//TableForm=

True	
True	True
True	
True	
True	True
False	
True	
False	True
True	
True	True
False	
False	
False	False
True	
True	
False	False
True	
False	
False	True
True	
False	False
False	

In[26]= f = Implies[P, (Q || R)];

```
In[19]:= TableForm[Apply[List, %18, {1}]]
```

Qu[19]/TableForms		
True		
True		False
True		
True		
True	False	
False		
True		False
False		
True		
False	False	
False		
False	False	
True		False
False		
True		False
False		
False	False	
False		
False	False	
False		False
False		

```
In[20]:= f = Implies[p, q || p];
```

```
BooleanTable[{p, q} → f, {p, q}]
```

```
Out[21]= {{True, True} → True, {True, False} → True, {False, True} → True, {False, False} → True}
```

```
In[22]:= TableForm[Apply[List, {{True, True} → True, {True, False} → True, {False, True} → True, {False, False} → True}, {1}]]
```

```
In[14]:= f = (x && y) || (! z);
```

```
BooleanTable[{x, y, z} → f, {x, y, z}]
```

```
Out[15]= {{True, True, True} → True, {True, True, False} → True, {True, False, True} → False, {True, False, False} → True, {False, True, True} → False, {False, True, False} → True, {False, False, True} → False, {False, False, False} → True}
```

```
In[16]:= TableForm[Apply[List, %15, {1}]]
```

```
Out[16]//TableForm=
  True
  True      True
  True
  True
  True      True
  False
  True
  False     False
  True
  True
  False     True
  False
  False
  True      False
  True
  False     True
  True
  False
  False     False
  True
  False     True
  False
  False     False
  True
  False     True
  False
  False
```

```
In[17]:= f = !(Implies[Q, R]) && R && (Implies[P, Q]);
```

```
BooleanTable[{P, Q, R} → f, {P, Q, R}]
```

```
Out[18]= {{True, True, True} → False, {True, True, False} → False, {True, False, True} → False, {True, False, False} → False, {False, True, True} → False, {False, True, False} → False, {False, False, True} → False, {False, False, False} → False}
```