Simple English to Logic

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Neither nor

a. John likes neither apples nor pears
b. It's neither the case that John likes apples nor that John likes pears
c. Neither p nor q
    d. p = John likes apples
    e. q = John likes pears

p	q	Neither p nor q
T	T	F
T	F	F
F	T	F
F	F	T

Superbowl version

Facts

p	The Kansas City Chiefs were in the Superbowl.	T
q	The Tampa Bay Bucs were in the Superbowl.	T
r	The Buffalo Bills were in the Superbowl.	F
s	The Green Bay Packers were in the Superbowl.	F

.				p	q	Neither p nor q
Neither p nor q	Neither T nor T	F		T	T	F
Neither p nor r	Neither T nor F	F		T	F	F
Neither r nor q	Neither F nor T	F		F	T	F
Neither r nor s	Neither F nor F	T		F	F	T

Neither nor: Truth tables

ϕ = neither p nor q

p	q	ϕ	p & q	$\sim$(p & q)	$\sim$p	$\sim$q	$\sim$p & $\sim$q	p $\lor$ q	$\sim$(p $\lor$ q)
T	T	F	T	F	F	F	F	T	F
T	F	F	F	T	F	T	F	T	F
F	T	F	F	T	T	F	F	T	F
F	F	T	F	T	T	T	T	F	T

Unless

	ϕ = p, unless q	p	q	ϕ
a.	John will quit, unless his boss fires Susan	T	T	T†
b.	p, unless q	T	F	T
c.	p = John will quit	F	T	T
d.	q = John's boss fires Susan	F	F	F

The falsifying case is when John doesn't quit (p) and his boss doesn't fire Susan(q). We just said he would (unless q); q failed to happen, and no p.

$\dagger$ This is the tricky one. John's boss fires Susan and John quits anyway. The firing was supposed to be the one thing that could prevent the quitting, but it hasn't. Key word: *could* prevent. We read this sentence as: the only thing that might prevent the quitting is the firing; but we do not read it as guaranteeing that the firing prevents the quitting.

unless:Truth Tables

$\phi = $ p, unless q

p	q	ϕ	$\sim$ p	$\sim$ q	$\sim$ p $\rightarrow$ q	p $\vee$ q	$\sim$ q $\rightarrow$ p
T	T	T	F	F	T	T	?
T	F	T	F	T	T	T	?
F	T	T	T	F	T	T	?
F	F	F	T	T	F	F	?

$\rightarrow$	T	F		$\sim$	
T	T	F		T	F
F	T	T		F	T

Outline