Lecture 1
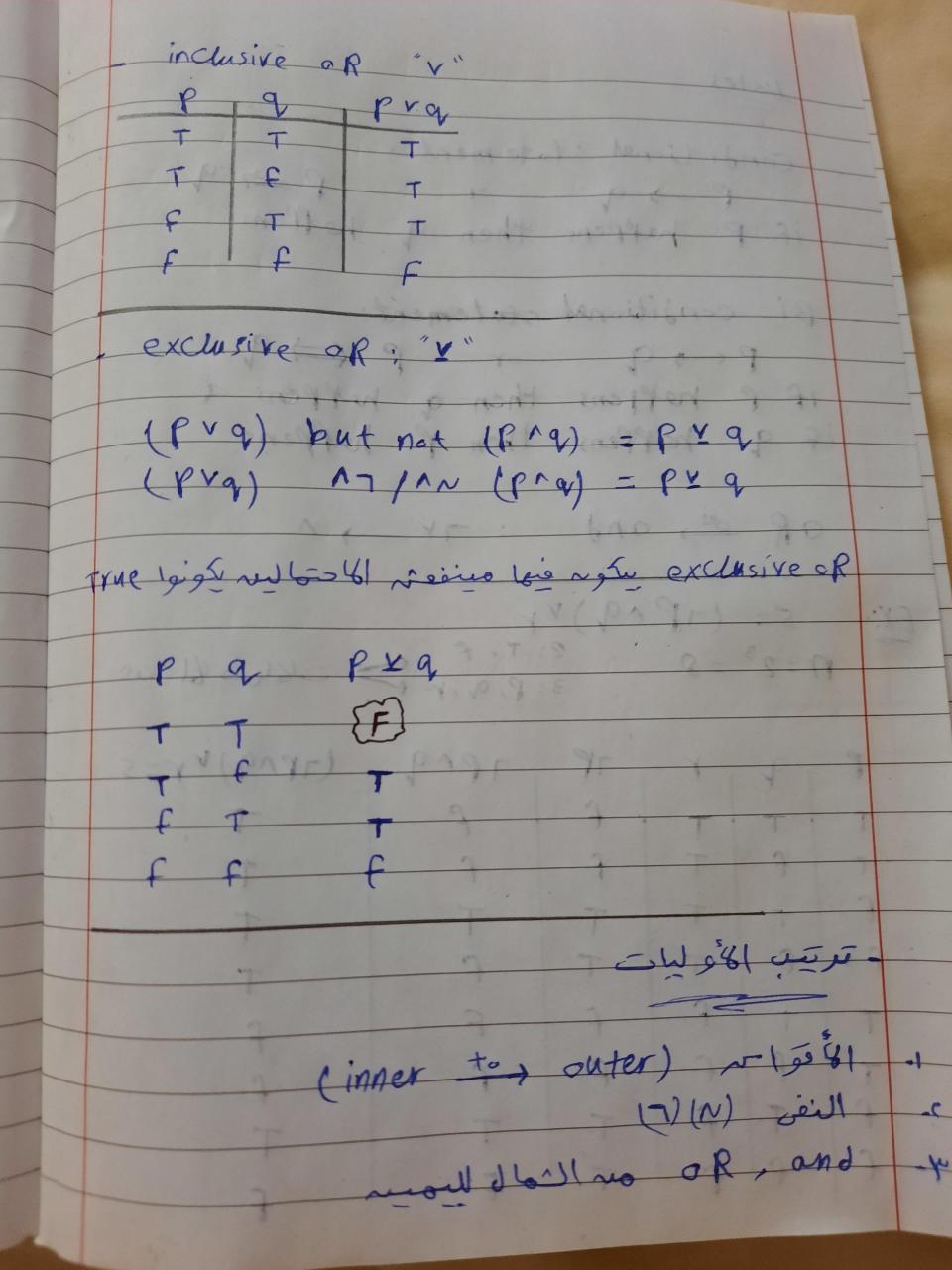
statements (Proposition):-
When we have only one value either (True)
or (false), That is considered a statement
or Proposition.

EX:-

$5 \longrightarrow$ neither True nor false so
it isn't Proposition.

$3+2 \longrightarrow$ " " "

$3+2= \longrightarrow$ " " "

$3+2=5 \longrightarrow$ True so it's a statement

$4+1=7 \longrightarrow$ false " " "

$x+y > 0 \longrightarrow$ We don't have the values
of x, y, so This case may be
True or false
(we have two values $\begin{cases} \text{true} \\ \text{false} \end{cases}$
not one)
So it'sn't a statement

⇒ Connectives:-

1- Negation   النفي (￢) (∼)

P	￢P / ∼P
True ①	false ⓪
false ⓪	True ①

2-   AND   "∧"

P	q	P∧q
T	T	T
T	f	f
f	T	f
f	f	f

3-   OR "∨" ⟶ inclusive oR   "∨"
            ⟶ exclusive oR   "∨"

- inclusive oR "v"

p	q	p v q
T	T	T
T	F	T
F	T	T
F	F	F

- exclusive oR ; "⊻"

$(P \lor q)$ but not $(P \land q) = P \veebar q$

$(P \lor q) \land \lnot / \land \sim (P \land q) = P \veebar q$

exclusive oR يكون في حقيقته الاحتمالين يكونوا True

p	q	p ⊻ q
T	T	{F}
T	F	T
F	T	T
F	F	F

- ترتيب الأولويات

←═══

١. الأقواس (inner → outer)

ج. النفي (⌐) (N)

ب. and , oR من الثاني لليمين

Notes

- Conditional statement :

$$P \rightarrow q \qquad \text{or} \qquad P \Rightarrow q$$

if P happens then q happens

- Bi- conditional statement:

$$P \leftrightarrow q \qquad \text{or} \qquad P \Longleftrightarrow q$$

if P happens then q happens &
if q happens then P happens

- OR في , and : $\neg \vee \longrightarrow \wedge$

EX:
$$S = (\neg P \wedge q) \vee r$$
$$n = 2^3 = 8$$

2: T , f
3: P, q, r ⟵ عدد او احتمالات

p	q	r	¬P	¬P∧q	(¬P∧q)∨r = S
T	T	T	f	f	T
T	f	T	f	f	T
f	T	T	T	T	T
f	f	T	T	f	T
T	T	f	f	f	f
T	f	f	f	f	f
f	T	f	T	T	T
f	f	f	T	f	f