```
3336

OH 3

10:05
```

Unmute to ask questions!

ex Bob is funny is this a statement??

note 1) we can treat it as a statement

note 2) I don't think this is an actual statement

ex! Houston is in Texas. (True)

Exeryone is wearing a hat.

T(Everyone is wearing a hat)

= there is at least one person not wearing a hat

= some people are not wearing a hat

note: this green example uses "quantifiers"

Quantifiers

person, that person is wearing a host

7	a	PL=7Q
T	T	
7	F	F
F	٢	F
F	F	T

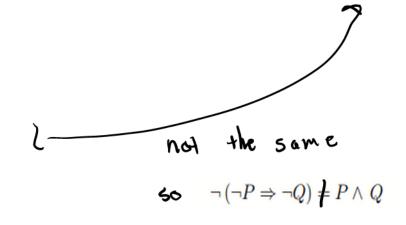
P	0	P⊕Q	7 (P (D)
T	T	F	Т
T	F	T	F
F	Т	T	F
F	F	F	T

Statement 28 (pg. 25 - Casey's Notes)

$$\neg (\neg P \Rightarrow \neg Q) = P \land Q$$

P	Q	78	70	7P => 7Q	7(7) => 7(7)
T	Τ	F	F	T	F
T	F	F	T	T	F
F	Т	T	F	F	T
F	F	T	7	T	F

P	Q	P~Q
T	7	î
7	F	F
F	٢	F
F	F	F



P	Q	78	TPAQ
T	7	F	F
7	F	F	F
F	T	T	7
F	F	T	IF

note
$$\neg(A \Rightarrow B) = A \wedge \neg B$$

(above: $\neg(\neg P \Rightarrow) \neg Q) = (\neg P) \wedge (\neg \neg Q)$
 $= \neg P \wedge Q$

we first talk about sets!

A set is a collection of objects

ex)
$$\{-1, [1, 0], 0, \pi \} = 5$$

this set has 4 objects

no objects

Quantifiers

ex) $\emptyset = \text{"the empty set} = \{ \}$

$$N = \{0, 1, 2, 3, ...\} = "naturals"$$

ex) Yx E IR, x>0

"every real number is positive"

false statemat

ex) YxET, x>0

ex] JxER, x70

there are real numbers
that are positive

true statement

Quantified Statements always refer

Mathematicians assume "if - then's statements are quantified (using Y):

math: $\forall x \in \mathbb{R}, x > 0$