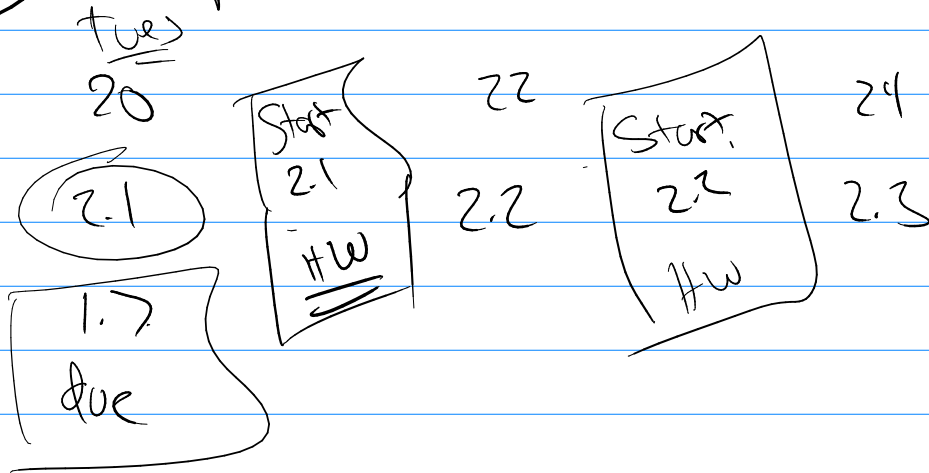


# Math 321

## Study "Skills"

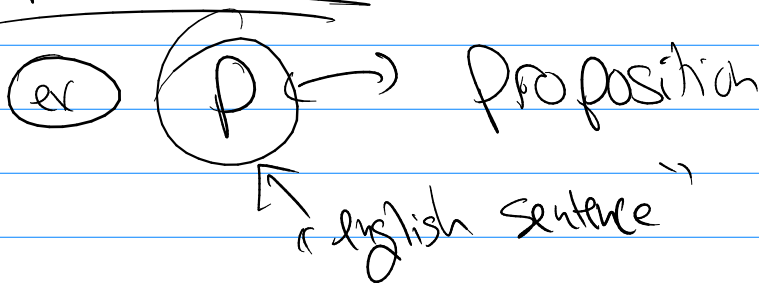
(ex) Sept 20-24



## Propositional Logic

Def: Proposition  $\equiv$  A declarative sentence that is either true or false, but not both.

### Propositional variable



no matter what proposition  
it can only evaluate to

$P$  represents  
true or false  
 $T$   $F$

table

"truth table"

$P$
$T$
$F$

give two  
variables

$S$	$t$
$T$	$T$
$T$	$F$
$F$	$T$
$F$	$F$

with 3

$P$	$q$	$r$
$T$	$T$	$T$
$T$	$T$	$F$
$T$	$F$	$T$
$T$	$F$	$F$
$F$	$T$	$T$
$F$	$T$	$F$
$F$	$F$	$T$
$F$	$F$	$F$

Objects

and

Operations on  
the objects

$\frac{7}{15}$

$\frac{1}{15}$   
 $\frac{1}{3}$   
 $\frac{1}{15}$

$\frac{1}{15}$   
 $\frac{1}{3}$   
 $\frac{1}{15}$

$\frac{1}{15}$   
 $\frac{1}{3}$   
 $\frac{1}{15}$

$\frac{1}{15}$   
 $\frac{1}{3}$   
 $\frac{1}{15}$

$\frac{1}{15}$   
 $\frac{1}{3}$   
 $\frac{1}{15}$   $= \frac{7}{15}$

Logic

Objects

Propositions

what to do?

① Negation: denotes

②  $P$ : "My name is Mark"

Negation: "It is not the case that, my name is Mark"  
 $\neg$  & "not"

Symbols:  $\neg P$

$P$	$\neg P$
T	F
F	T

truth table

② Conjunction "and"

Symbols:  $P \wedge Q$

$\approx$  english and = but = yet = however

truth table

$P$	$Q$	$P \wedge Q$
T	T	T
T	F	F
F	T	F
F	F	F

③ disjunction "or"

Symbols  $p \vee q$

truth table

$p$	$q$	$p \vee q$
T	T	T
T	F	T
F	T	T
F	F	F

④ Exclusive or "or"

Symbols  $p \oplus q$

truth table

$p$	$q$	$p \oplus q$
T	T	F
T	F	T
F	T	T
F	F	F