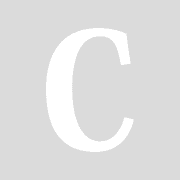
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**Predicates and Quantified Statements**

Universal

∀

x

∈

D, P(x)

∃

x

∈

D, ~P(x)

Existe

​

ntial

∃

(

x,y

)

∈

D,x≠y|

​

P(x,y)

∀

(

x,y

)

∈

D,x≠y|

​

~P(x,y)

Universal Condit

​

ional

∀

x, P(x)→Q(x)

∃

x

∈

D|P(x)

​

∧

~Q(x)

~exist

​

ential = universal

~universal = existe

​

ntial

**More Formal Statements**

Formal Contra

​

pos

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itive

∀

x

∈

D, ~Q(x)→

​

~P(x)

Formal Converse

Q(x)→P(x)

∀

x

∈

D

Formal Inverse

∀

x

∈

D, ~P(x)→

​

~Q(x)

**MQ Invalid Arguments**

Quantified Converse

∀

x, P(x)→Q(x)

Q(j) for a particular j

∴

P(j)

Quantified Inverse Error

∀

x, P(x)→Q(x)

~P(j) for a particular j

∴

~Q(j)

**Multiple Quanti**

**​**

**fiers**

Existe

​

ntial MQ

∃

x

∈

D|

∀

y

∈

E, P(x, y)

Neg. MQ

∀

x

∈

D,

∃

y

∈

E | P(x, y)

[

original

]

∃

x

∈

D,

∀

y

∈

E | ~P(x, y)

negation

]

[

Universal Modes

Pones

∀

x

∈

Z, P(x)→Q(x)

P(k), for a particular k

∈

Z

∴

~Q(k)

Universal Modus

Tones

∀

x

∈

D, P(x)→Q(x)

~Q(j), j

∈

D

∴

~P(j)

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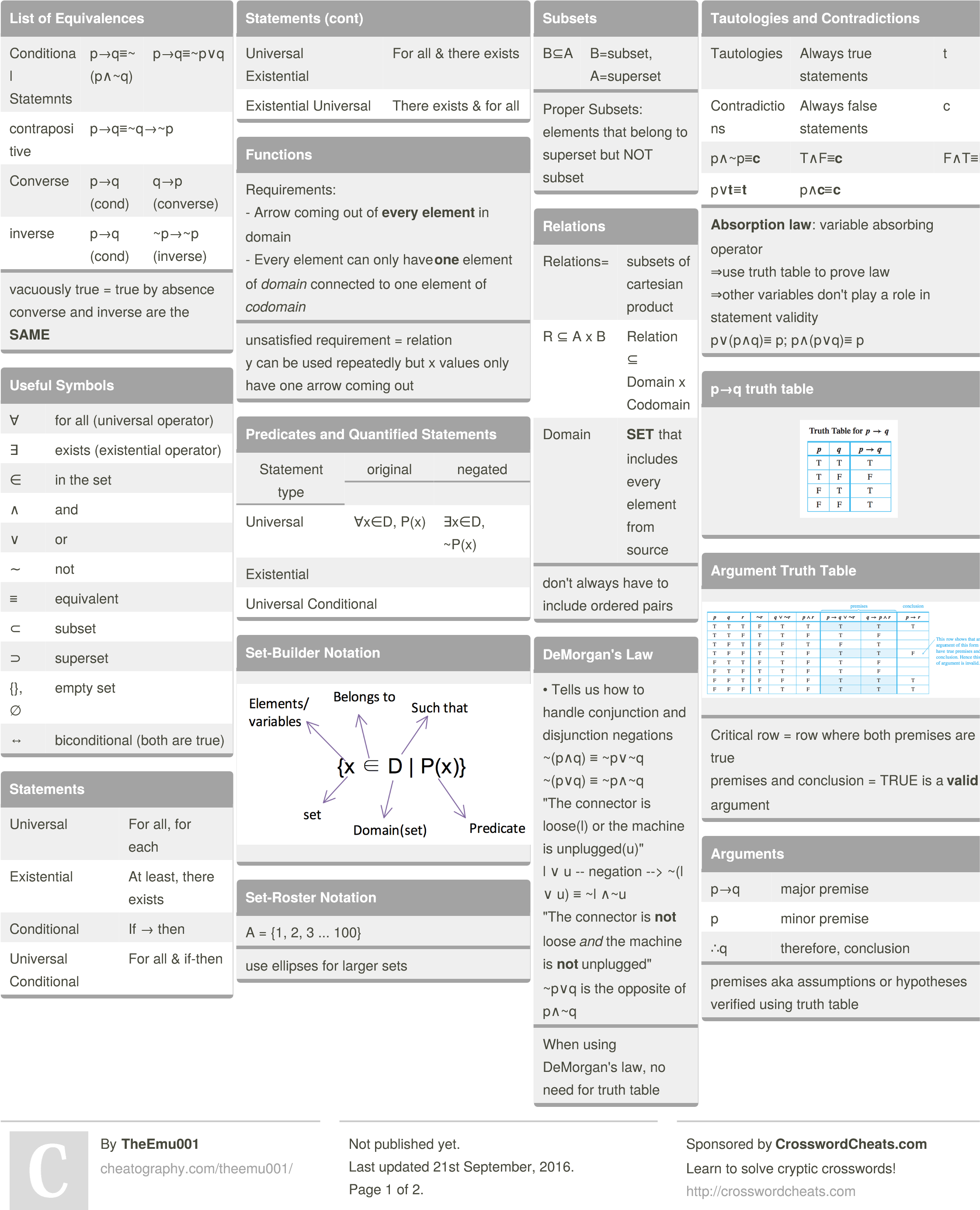
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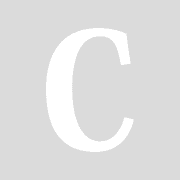
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**Argument Forms (VALID)**

Modus Pones

p→q

p

∴

q

Modus Tollens

p→q

~q

∴

~p

Gneral

​

ization

p

∴

p

∨

q

Specia

​

liz

​

ation

p

∧

q

∴

q

Elimin

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ation

p

∨

q

~q

∴

p

Transi

​

tivity

p→q

q→r

∴

p→r

Proof by div. into cases

p

∨

q

p→r

q→r

∴

r

**Fallacy (INVALID ARGUMENTS)**

Converse Error

p→q

q

⇒

∴

p

Inverse Error

q→p

~p

∴

~q

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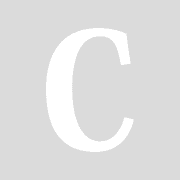
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Common Sets

N

All Natural numbers = {1, 2, 3, 4, ...}

Z

All Integers = {..., −2, −1, 0, 1, 2, ...}

Z

All Positive integers = {0, 1, 2, ...}

Common Sets (copy)

N

All Natural numbers = {1, 2, 3, 4, ...}

Z

All Integers = {..., −2, −1, 0, 1, 2, ...}

Z

All Positive integers = {0, 1, 2, ...}

Examples

4

∈ A

4

is an element of A

2

∉ A

2

is not an element of A

Examples (copy)

∈ A

4

4

is an element of A

2

∉ A

2

is not an element of A

Examples (copy)

4

∈ A

4

is an element of A

2

∉ A

2

is not an element of A

Examples (copy) (copy)

∈ A

4

4

is an element of A

∉ A

2

2

is not an element of A

Examples (copy) (copy) (copy)

4

∈ A

4

is an element of A

2

∉ A

2

is not an element of A

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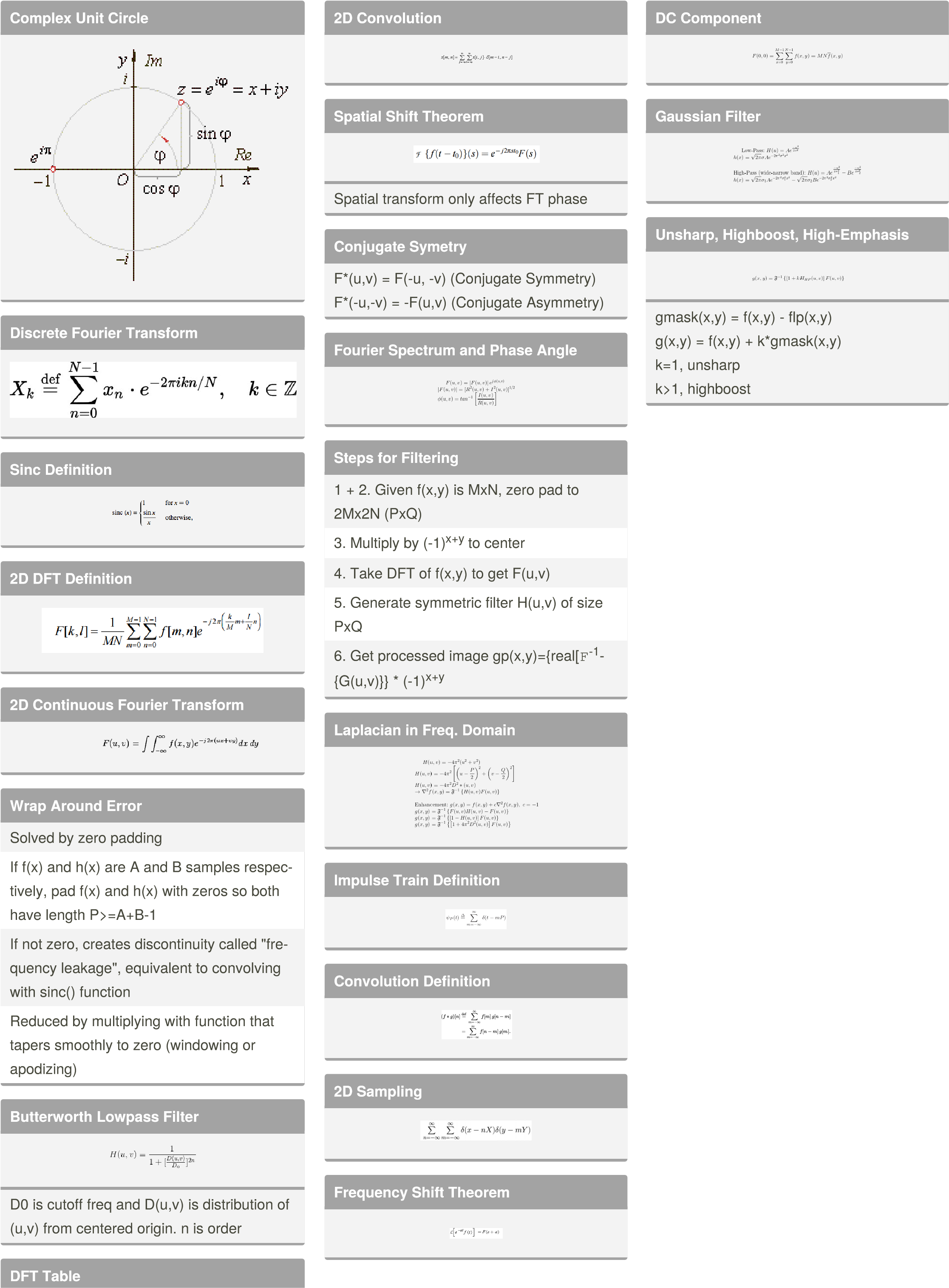
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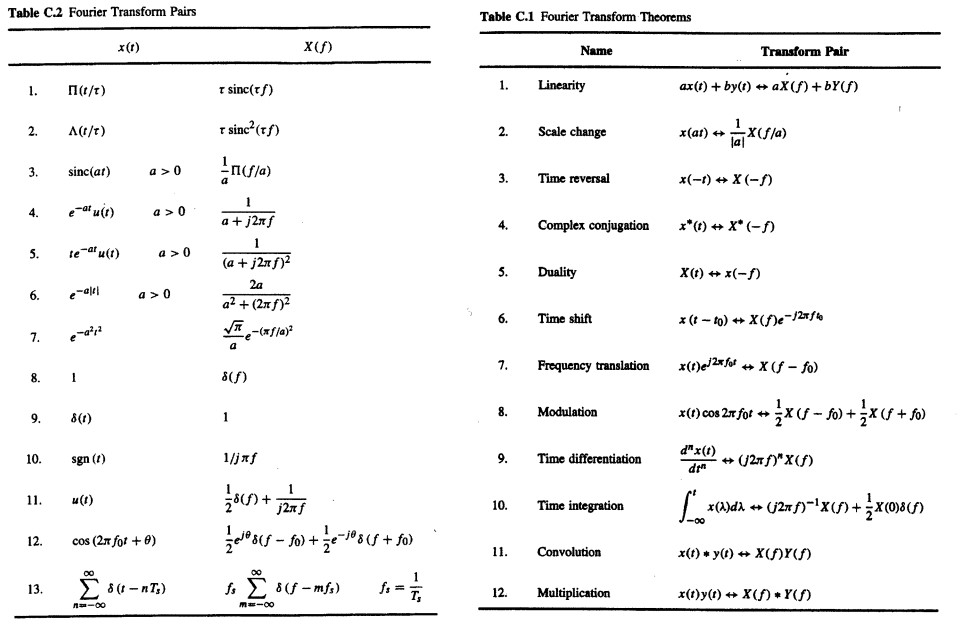
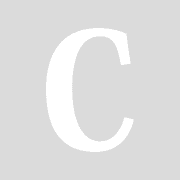
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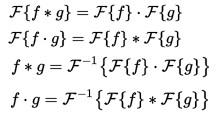
**Fourier Series Definition**



**Convol**

**​**

**ution Theorem**



Space convol

​

ution = frequency multip

​

lic

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ation

**Center DC**

To shift

**F(0,0)**

(DC Component) to center,

multiply by

**(-1)**

**​**

**Power Spectrum**



Total power of image is just sum of P(u,v)

over P-1,Q-1

a = 100[do

​

ublesum P(u,v)/Pt]

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(

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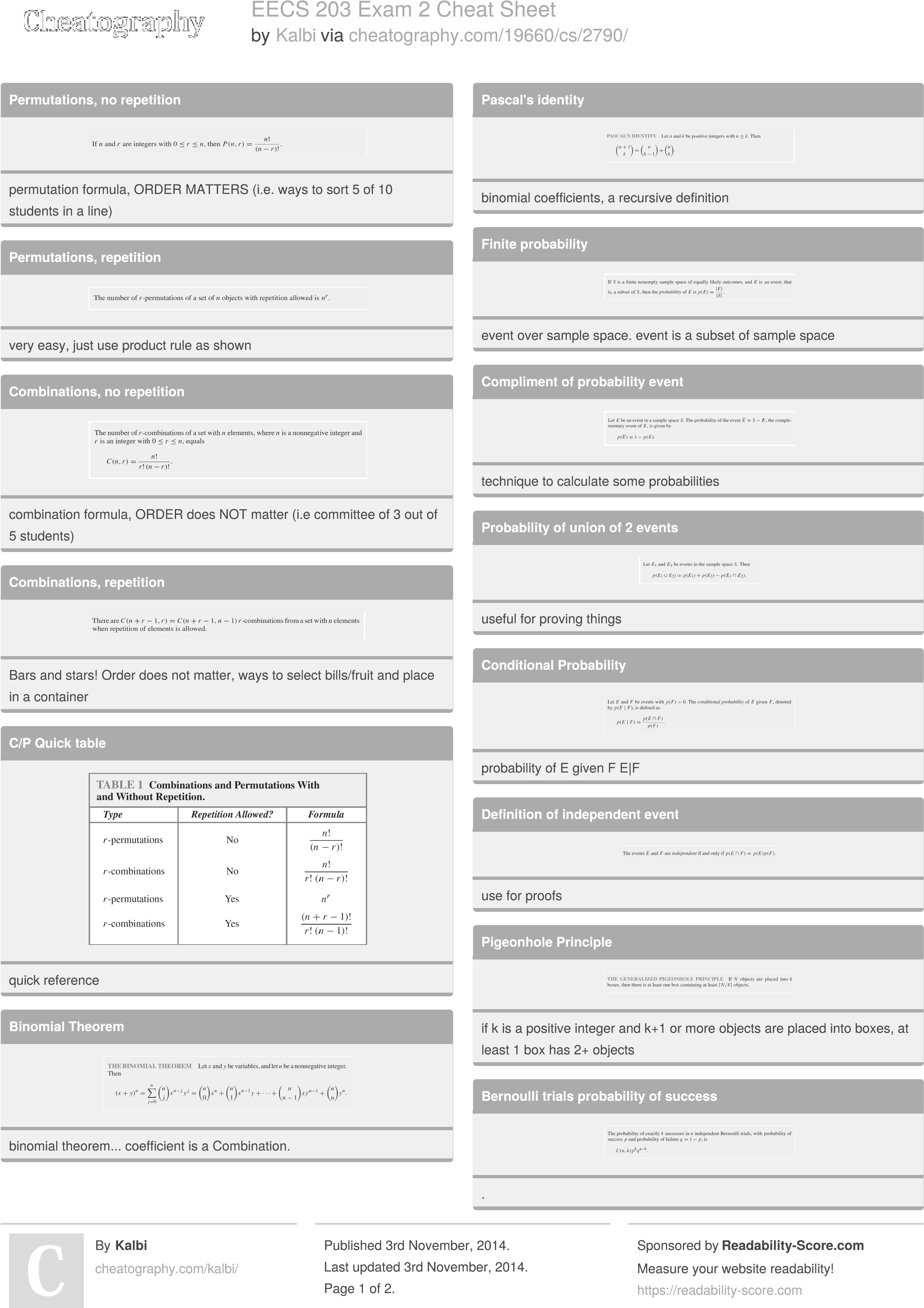
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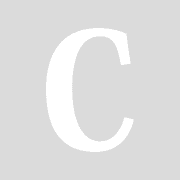
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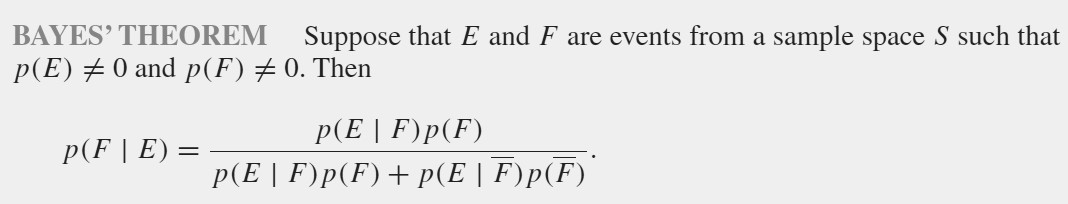
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**Baye's theorem**



calculate probab

​

ility of i.e diseas

​

es/

​

dia

​

gnosis, probab

​

ility of spam...

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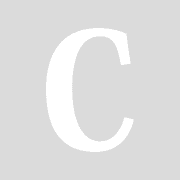
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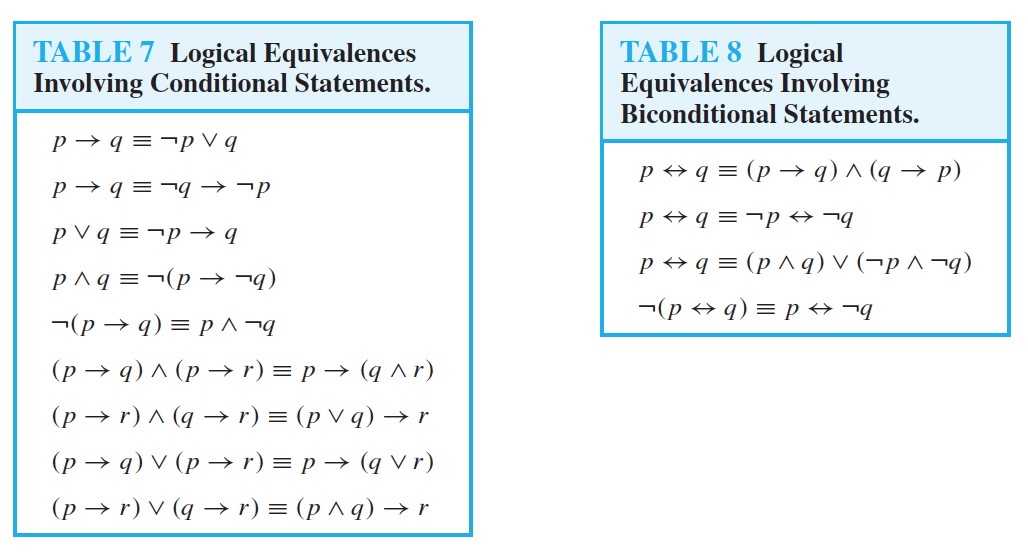
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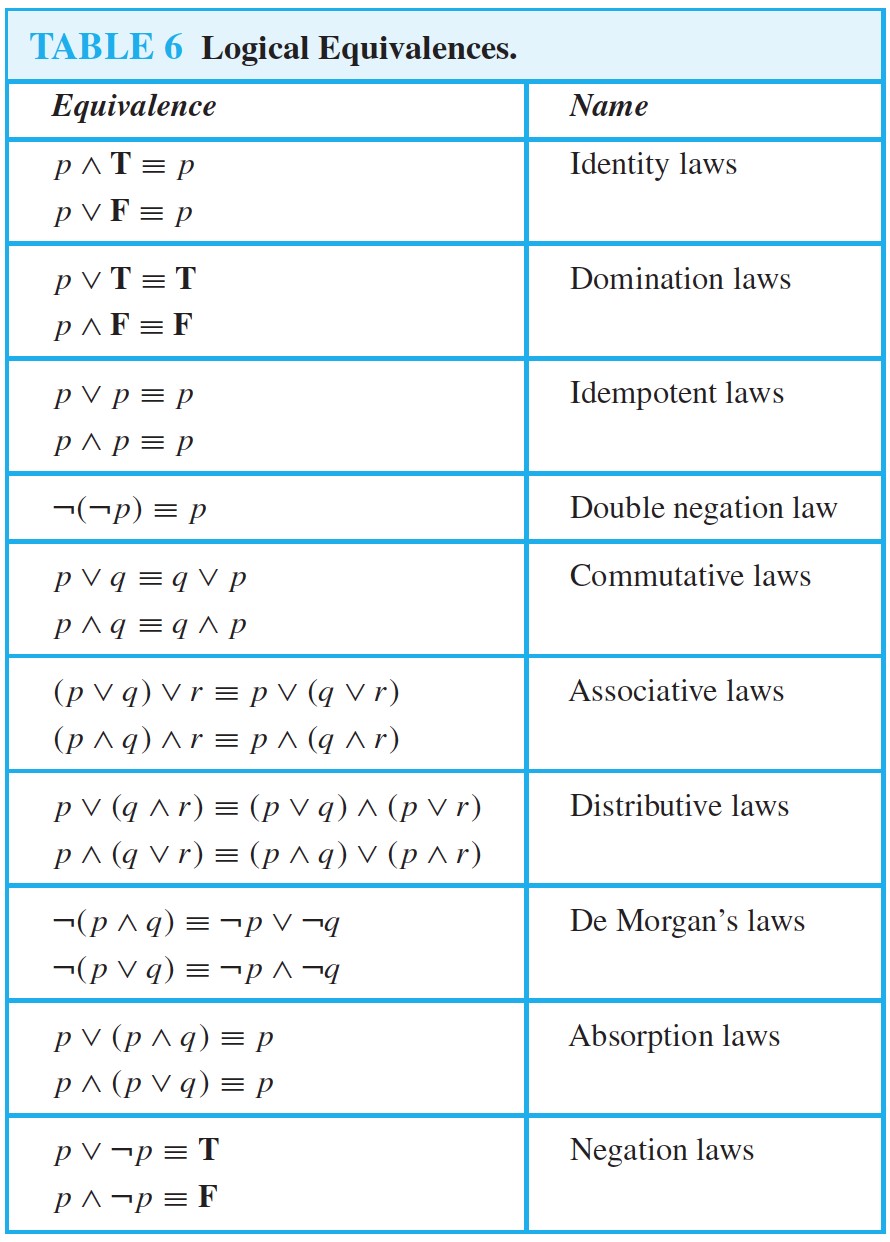
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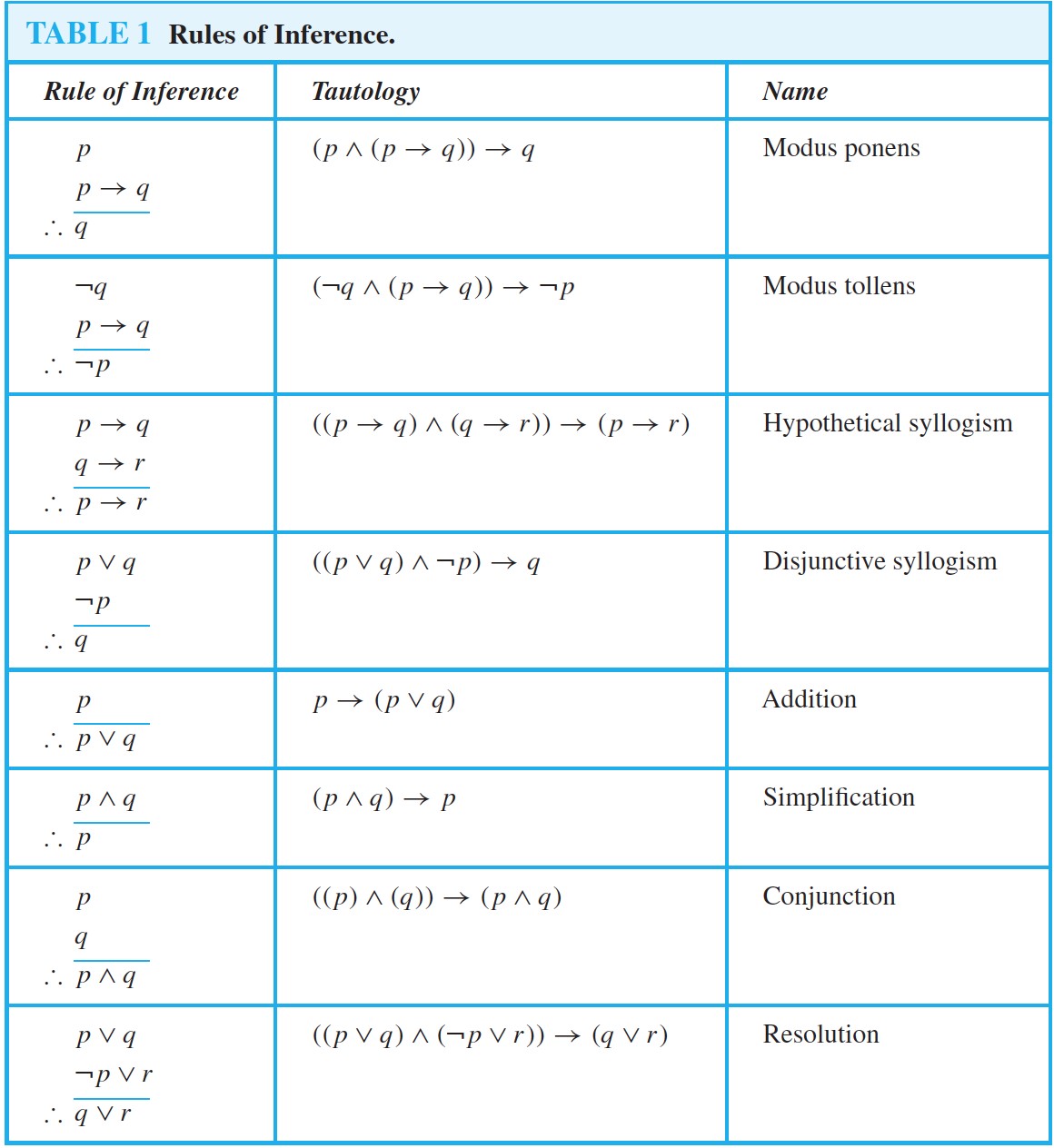
kk

**Proof Laws**



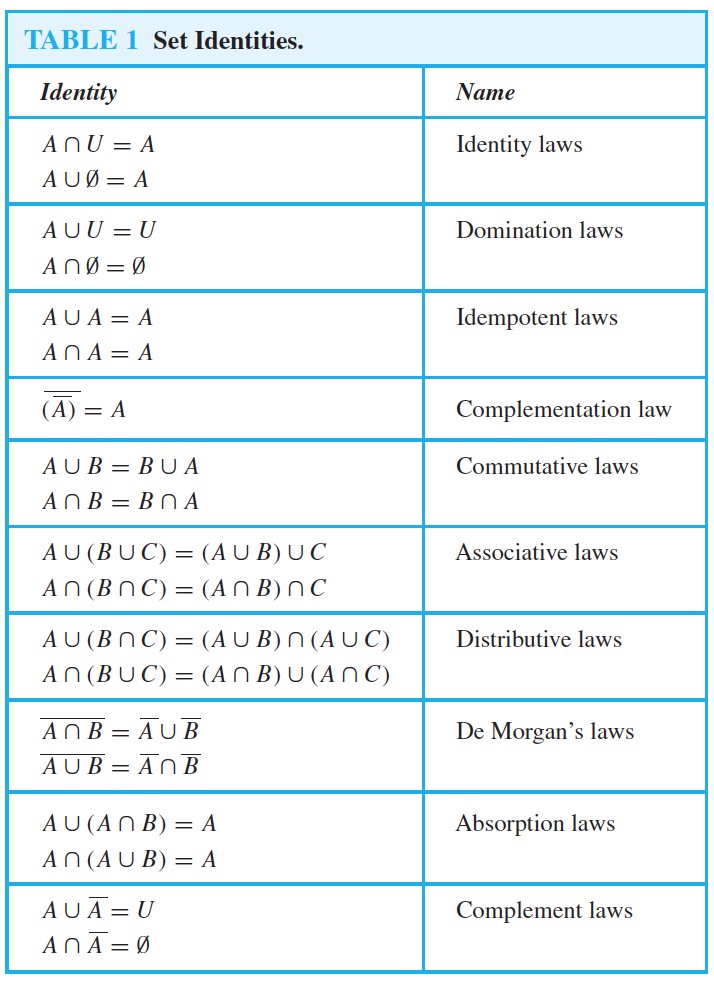
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**Inference**



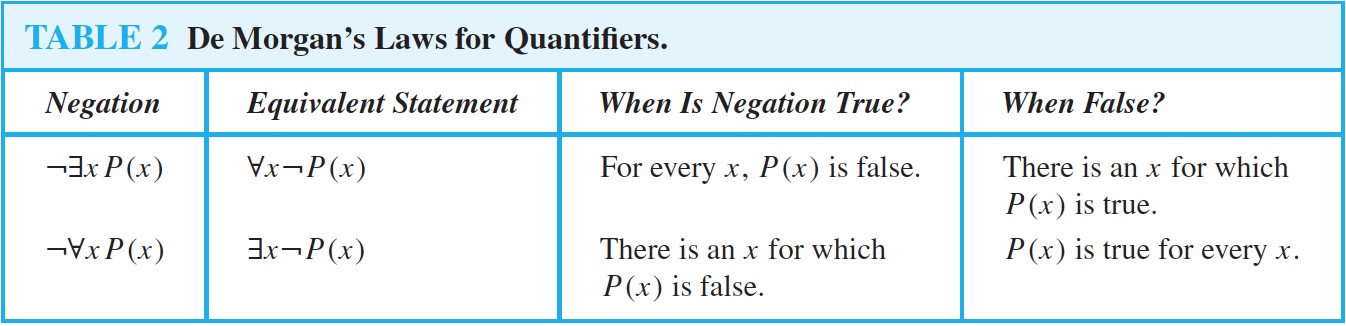
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**Set ID's**



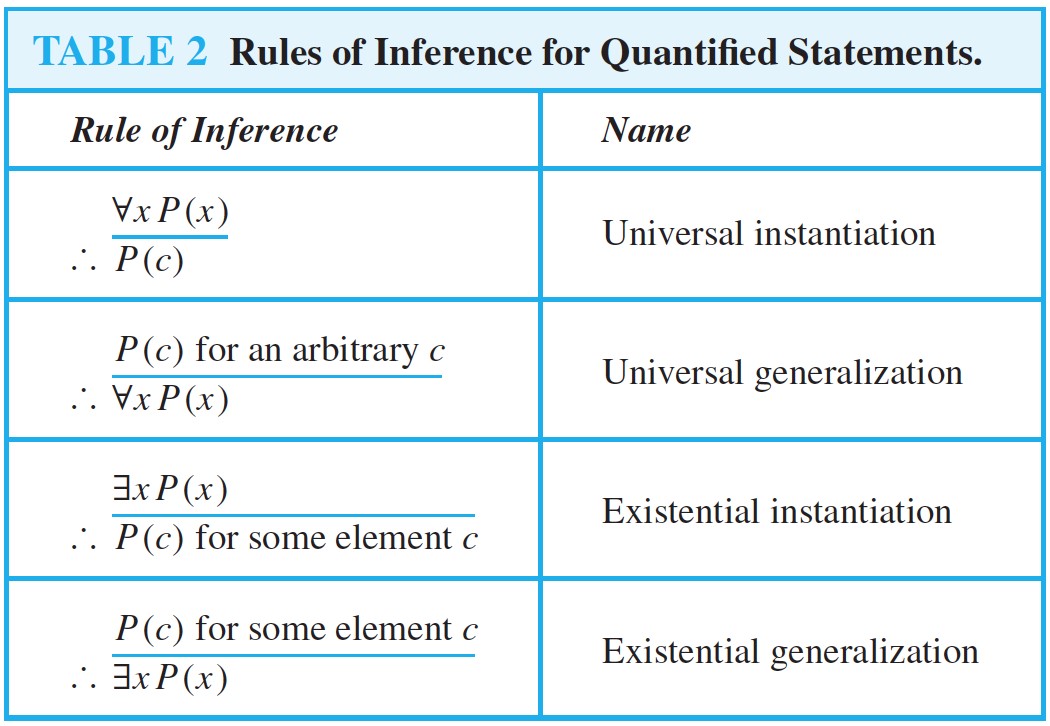
wow

**DeMorgans Quant**



k

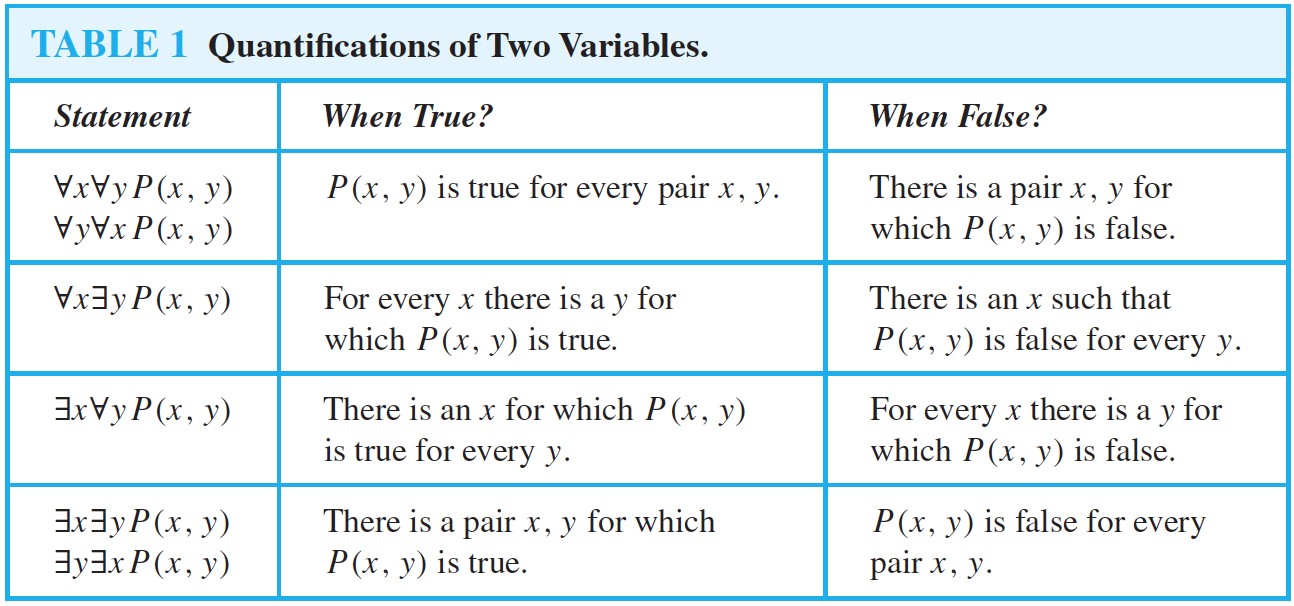
**Quant Inference**



m

**2**

**Var Quant**



k

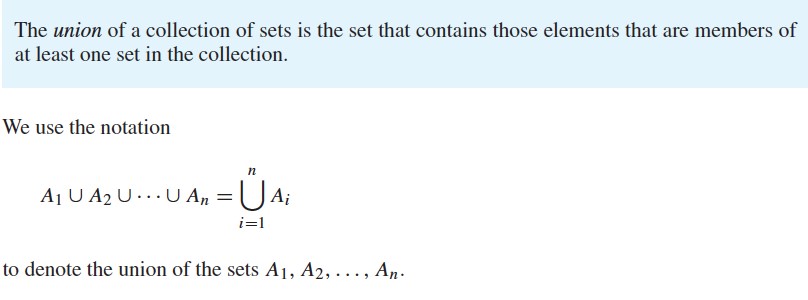
**Union/**

**​**

**Int**

**​**

**ersect Collection**



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