



# Discrete Mathematics

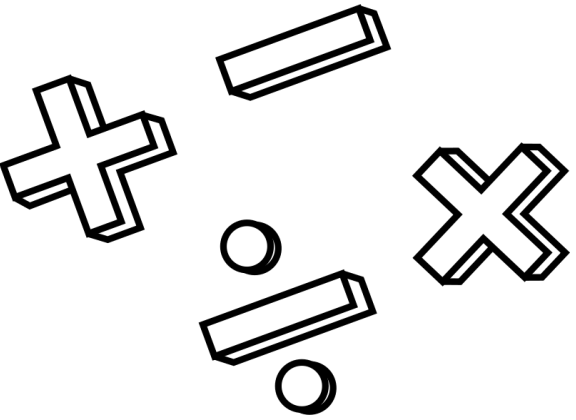
## **TITLE:** EXAMPLE OF CONVERSION FROM ENGLISH SENTENCE TO LOGICAL EXPRESSION AND VICE VERSA

Presented by -

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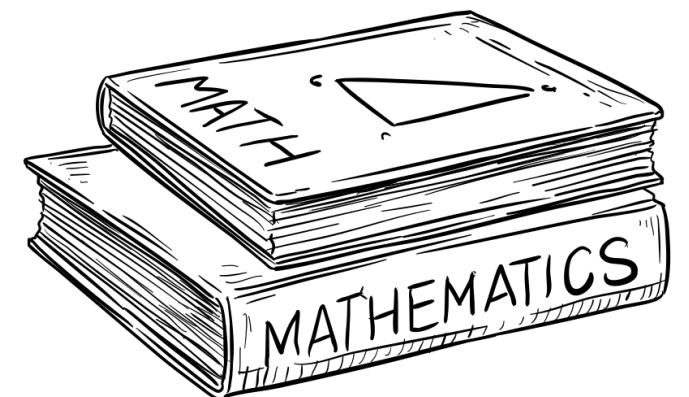


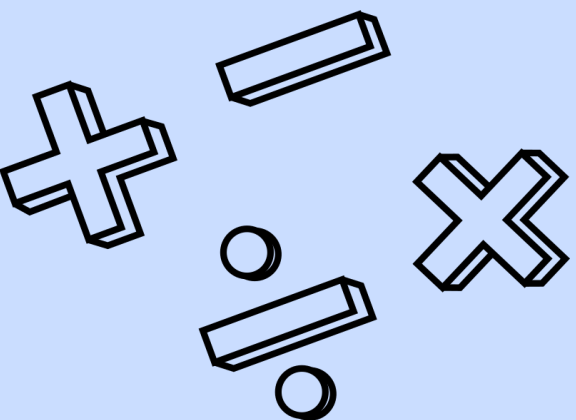
# WHAT IS A LOGICAL EXPRESSION?

**A logical expression is a formal way to represent statements using symbols.**

**It expresses truth values: TRUE (T) or FALSE (F)**

**Helps to avoid ambiguity in reasoning compared to natural language.**

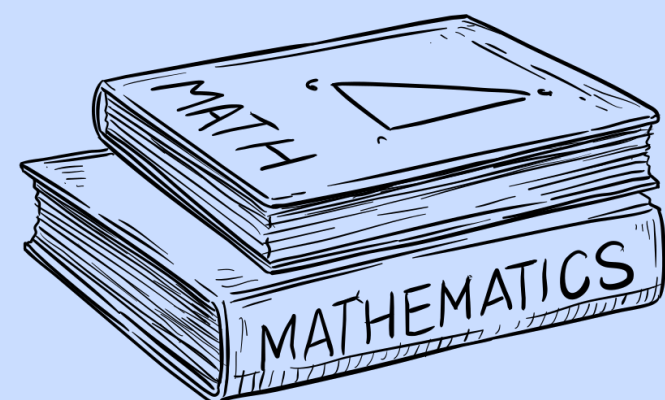




# WHY CONVERT ENGLISH SENTENCES TO LOGICAL EXPRESSIONS?

**To simplify complex statements for analysis.**

**To perform logical reasoning in mathematics and computer science.**



**Useful in programming, AI, and automated decision-making.**

# BASIC SYMBOLS

**AND  $\wedge$**

“It is sunny AND  
warm”

# BASIC SYMBOLS

**AND  $\wedge$**

“It is sunny AND  
warm”

# BASIC SYMBOLS

**AND  $\wedge$**

“It is sunny AND  
warm”

**OR  $\vee$**

“It is raining OR  
snowing”

# BASIC SYMBOLS

**AND  $\wedge$**

“It is sunny AND  
warm”

**OR  $\vee$**

“It is raining OR  
snowing”

# BASIC SYMBOLS

**AND  $\wedge$**

“It is sunny AND  
warm”

**NOT  $\neg$**

“It is NOT raining”



# BASIC SYMBOLS

**AND  $\wedge$**

“It is sunny AND  
warm”

**OR  $\vee$**

“It is raining OR  
snowing”

**NOT  $\neg$**

“It is NOT raining”

# BASIC SYMBOLS

**AND  $\wedge$**

“It is sunny AND  
warm”

**IMPLIES  $\rightarrow$**

“If it rains, then the  
ground is wet”

# BASIC SYMBOLS

**AND  $\wedge$**

“It is sunny AND warm”

**OR  $\vee$**

“It is raining OR snowing”

**NOT  $\neg$**

“It is NOT raining”

**IMPLIES  $\rightarrow$**

“If it rains, then the ground is wet”

# BASIC SYMBOLS

**AND  $\wedge$**

“It is sunny AND  
warm”

**Bi-conditional  $\leftrightarrow$**

“It rains if and only if  
the sky is cloudy”

**IMPLIES  $\rightarrow$**

“It rains, then the  
ground is wet”

# BASIC SYMBOLS

**AND  $\wedge$**

“It is sunny AND warm”

**OR  $\vee$**

“It is raining OR snowing”

**NOT  $\neg$**

“It is NOT raining”

**IMPLIES  $\rightarrow$**

“If it rains, then the ground is wet”

**Bi-conditional  $\leftrightarrow$**

“It rains if and only if the sky is cloudy”

# ENGLISH $\rightarrow$ LOGICAL EXPRESSION

**English Sentence: “If it is sunny, then I will go to the park.”**

**Logical Expression:**

**LET P: “IT IS SUNNY”**

**LET Q: “I WILL GO TO THE PARK”**

**Expression:  $P \rightarrow Q$**

# ENGLISH $\rightarrow$ LOGICAL EXPRESSION

English Sentence: "I will eat ice cream if it is hot AND I am not busy."

Logical Expression:

LET, H: "IT IS HOT"

B: "I AM BUSY"

I: "I WILL EAT ICE CREAM"

Expression:  $(H \wedge \neg B) \rightarrow I$

# LOGICAL EXPRESSION $\rightarrow$ ENGLISH

**Logical Expression:  $\neg R \vee S$**

**LET R: "IT IS RAINING"**

**LET S: "I WILL CARRY AN UMBRELLA"**

**English: "Either it is NOT raining, or I will carry an umbrella."**





**THANK YOU FOR  
LISTENING!**