

# Introduction to Logical Reasoning

## *Review Session for Exam #2*

David Emmanuel Gray

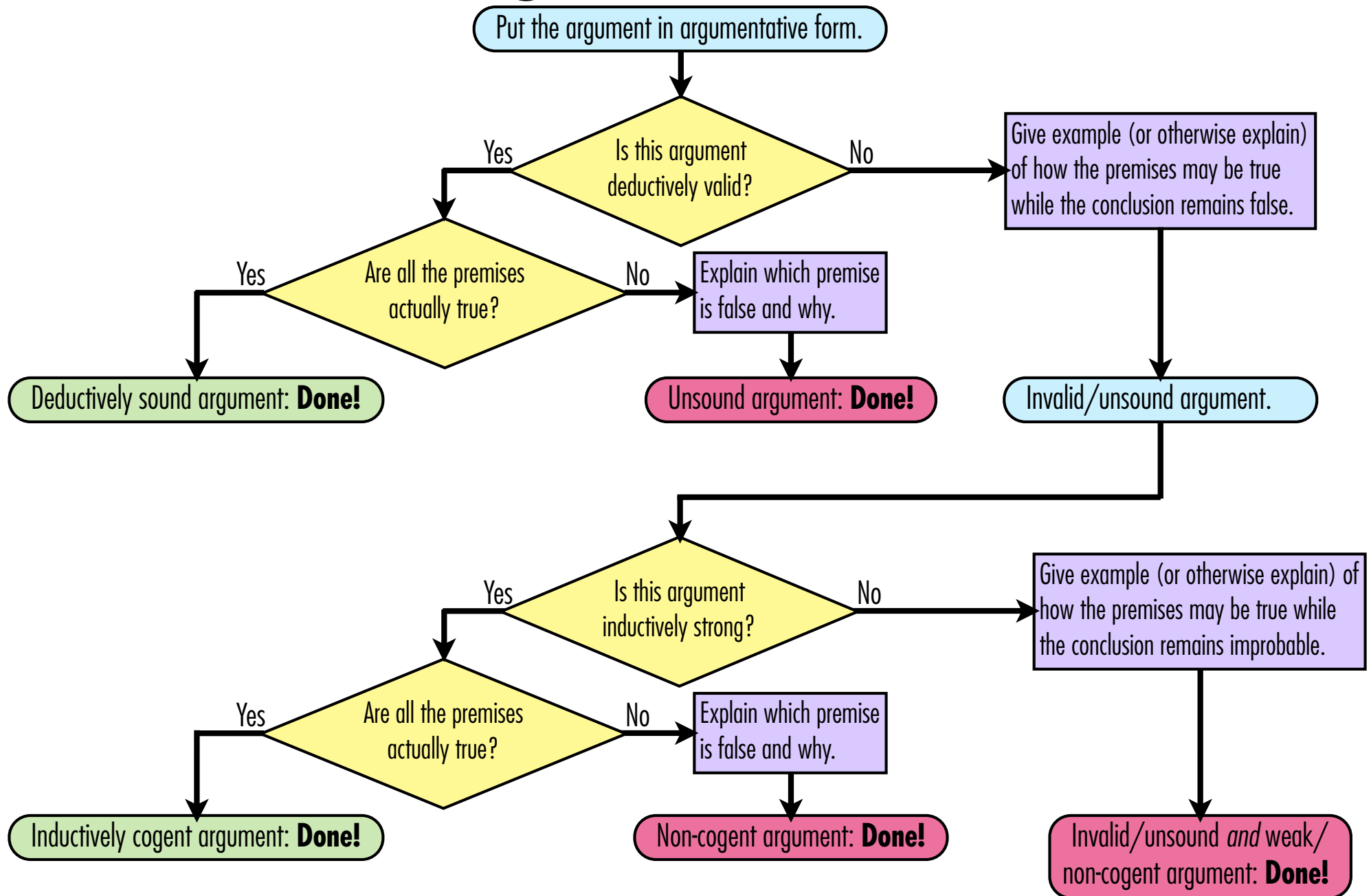
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*Northwestern University in Qatar*  
*Carnegie Mellon University in Qatar*

# The Skills You Have Practiced...

1. Informal argument assessment,
2. Translating English into the language of logic,
3. Assessing arguments with truth tables, and
4. Natural deduction.

# Informal Argument Assessment



# Common Problems

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People sometimes forget the procedure and/or confuse the different meanings of the terms “valid”, “invalid”, “sound”, “unsound”, “strong”, “weak”, “cogent”, and “non-cogent”.

# Two Examples

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## Argument 1

If you will see Hafsa, then she will ask you for money. You will see Hafsa. Therefore, she will ask you for money.

## Argument 2

If you will see Hamid, then he will probably ask you for money. You will see Hamid. Therefore, he will ask you for money.

# Translating English to Logic

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Translating English to the language of logic requires determining the logical form of a statement, or a series of statements.

# Common Problems

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In general, remember the indicator words. But don't get complacent (you are not a robot)!

## **Common Conjunctive Indicators**

|                  |        |             |
|------------------|--------|-------------|
| and              | but    | while       |
| both ... and ... | yet    | however     |
| also             | though | furthermore |

## **Common Disjunctive Indicators**

|    |                   |        |
|----|-------------------|--------|
| or | either ... or ... | unless |
|----|-------------------|--------|

## **Common Hypothetical Indicators**

|                 |                  |                            |
|-----------------|------------------|----------------------------|
| if ... then ... | if [vs.] only if | necessary [vs.] sufficient |
|-----------------|------------------|----------------------------|

# Common Problems

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There are still some tricky patterns to remember:

- “not both” vs. “both not”,
- “sufficient” vs. “necessary”,
- “if” vs. “only if”, and
- the use of commas to distinguish sub-statements with parentheses.



# Two Examples

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## Statement 1

Getting straight A's is sufficient for making the Dean's list.

## Statement 2

Getting an A in logic is necessary for getting straight A's.

# Truth Table Argument Assessment

When assessing the validity of an argument with a truth table, you are doing the following:

1. Translating the argument (if it is in English) into the language of symbolic logic,
2. Putting the argument into argumentative form,
3. Constructing a complete truth table that includes columns for each premise and the conclusion, and
4. Seeing if the conclusion is always true when the premises are true.

# Example

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If I study hard then I will pass logic. Furthermore, if I pass logic then I will make the Dean's list. Therefore, if I study hard then I will make the Dean's list.

# Natural Deduction

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When assessing the validity of an argument with natural deduction, you are doing the following:

1. Translating the argument (if it is in English) into the language of symbolic logic,
2. Putting the argument into argumentative form, and
3. Using the nine rules of inference to derive the conclusion from the premises.

# Common Mistakes

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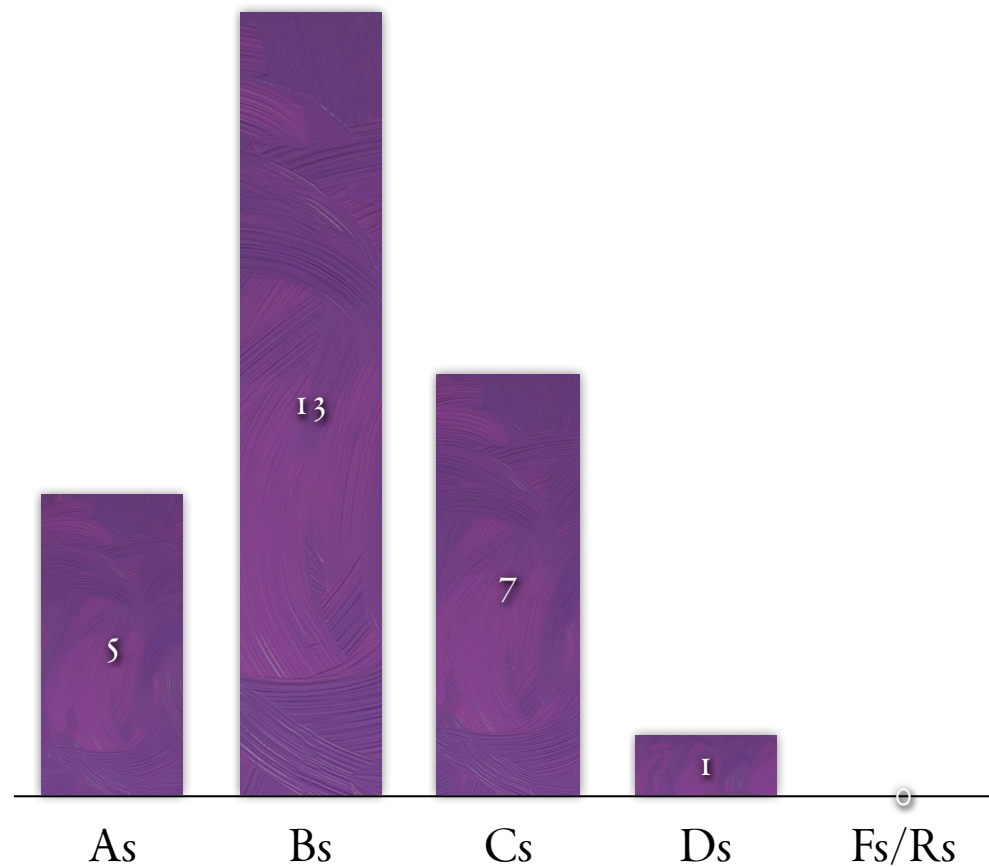
People tend to have a variety of distinct problems when doing natural deduction:

1. Forgetting or mixing up the nine rules of inference,
2. Not recognizing the simpler patterns when they appear,
3. Not keeping track of “what I need” and “what I can get”,
4. Not putting the numbers in the right order when stating the rule used,
5. Forgetting the last line is always the argument’s conclusion, and
6. Panicking and/or giving up.

# Quiz #8 Results

Class Distribution

| Points | Grade |
|--------|-------|
| 25–31  | A     |
| 20–24  | B     |
| 15–19  | C     |
| 10–14  | D     |
| 0–9    | F/R   |



# Next Class...

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**Exam #2** will begin promptly at 11:00am,  
so show up and be seated by that time.

Be aware that you will be asked to put anything  
you bring (including cell phone) in the aisle.  
Plan accordingly.

You will be provided with two pencils, one pen,  
and plenty of scratch paper.