

Chapter 2 – Logic, Proof, and Arguments

Chapter 2:

- Identify the hypothesis and conclusion in a statement and be able to write the converse, inverse, contra-positive, and bi-conditional statements.
- Compare and contrast undefined terms, postulates, definitions, and theorems.
- Analyze the validity of a deductive argument (i.e. counterexamples)
- Develop a logical conjecture using prior observations such as interior and exterior angle sums in a polygon.
- Prove conjectures in paragraph format, flow diagram, or two-column format.
- Use proof by contradiction (indirect proof) to prove conjectures

Standard 2.1 –

- Identify the hypothesis and conclusion in a statement and be able to write the converse, inverse, contra-positive, and bi-conditional statements.

Task: Given a statement write an IF, THEN statement from the original statement. After you have written the IF, THEN statement, identify the hypothesis and conclusion. From the IF, THEN write all of the parts of our bi-conditional and conditional statements.

Rubric

	0	1	2	3
Correct IF, THEN statement	Did not write an IF, THEN statement.	Wrote an IF, THEN statement that did not pertain to the original statement	Wrote an IF, THEN statement but flipped the IF and THEN parts.	Wrote a correct IF, THEN statement from the original statement.
Identification of the Hypothesis and Conclusion	Did not Identify correctly both the hypothesis AND the conclusion	Identified the correct hypothesis but the incorrect conclusion.	Identified the correct conclusion but the incorrect hypothesis	Identified both the hypothesis AND conclusion correctly.
Bi-conditional statement parts	Did not write a Bi-Conditional	Wrote a bi-conditional in an IF, THEN form	Wrote a Correct Bi-conditional.	
Conditional statement parts	Did not create any of the following: Inverse, Converse, or Contra-positive.	Created one of the following: Inverse, Converse, or Contra-positive	Created two of the following: Inverse, Converse, or Contra-positive	Created all three of the following: Inverse, Converse, AND Contra-positive

Standard 2.2 –

- Compare and contrast postulates, definitions, and theorems.

Task: Find the definitions for postulates, definitions and theorems then journal in your portfolio how postulates, definitions and theorems differ. Make sure you address all of three of them and describe in your own words what they mean.

Rubric

	0	1	2	3
Analysis of the vocabulary	Did not compare and contrast any of the words	Only talked about one of the three words	Talked about two of the words	Talked about all three of the words
Definitions of the vocabulary	Did not define any of the words	Defined one of the three words	Defined two of the three words	Defined all three.

Standard 2.3

- Develop a logical conjecture using prior observations such as interior and exterior angle sums in a polygon.

Task: Given an interior and exterior angles, come up with one conjecture and prove it using any method that you know.

Rubric

	0	1	2	3
Conjecture	Did not come up with a conjecture	Conjecture had nothing to do with interior or exterior angles.		Conjecture was well written and had to do with interior or exterior angles.
Proof	No Proof	Proof was incorrect, it did not prove the conjecture	Proof was mostly correct but a few gaps in logic	Proof was perfect

Standard 2.4

- Prove conjectures in paragraph format, and flow format.

Task: Write a paragraph showing how you know that the sun will rise every morning. Use the same idea to write a flow diagram.

Rubric

	0	1	2	3
Paragraph Proof	Did not write the proof in paragraph form	Paragraph has a good thesis but the logic does not fit and there is no conclusion	Paragraph has a good thesis with a good conclusion but missing some logic steps	Paragraph proves that the sun will rise every morning without any logic gaps
Flow Proof	Did not use a flow method to prove.	Flow has a good thesis but the logic does not fit and there is no conclusion	Flow has a good thesis with a good conclusion but missing some logic steps	Flow proves that the sun will rise every morning without any logic gaps

Standard 2.5

Use proof by contradiction (indirect proof) to prove conjectures

Task: Given a proof describe what is wrong with the logic, and fix it to make the proof correct.

Rubric

	0	1	2	3
Identification of the problem	Did not find a problems with the proof	Found 1 of the 3 problems	Found 2 of the 3 problems	Found all of the problems
Correct fix	Did not fix the proof, left it as is	Fixed 1 of the 3 problems	Fixed 2 of the 3 problems	Fixed all of the problems