Formal Geometry **2.2 Notes:**

2.2 Examples

1) Given the following conditional statement: If you live in Chicago, then you live in Illinois.

a) Write the converse.

b) Write the inverse.

c) Write the contrapositive.

d) Which of the statements are true?

e) Write the biconditional for this conditional. Is it a true statement? Explain.

2) If two lines in the same plane do not intersect, then they are parallel lines.

a) Write the contrapositive.

b) Write the converse.

c) Write the inverse.

d) Which of the statements are true?

e) Write the biconditional for this conditional. Is it a true statement? Explain.

Formal Geometry **2.4 Notes**

A *postulate* or *axiom* is a statement that is accepted as true without proof.

Postulates about points, lines, and planes:

- Through any two points there is exactly one line.
- Through any three noncollinear points, there is exactly one plane.
- A line contains at least 2 points.
- A plane contains at least 3 noncollinear points.
- If two points lie in a plane, then the entire line containing those points lies in the plane.
- If 2 lines intersect, then their intersection is exactly one point.
- If 2 planes intersect, then their intersection is a line.
- If 3 planes intersect, then their intersection is a point.

A *theorem* is a statement or conjecture that has been proven.

Theorem: If a point is a midpoint, then it divides a segment into 2 congruent segments.

Look at your proof packet for 2.4 examples on 2-column proofs.

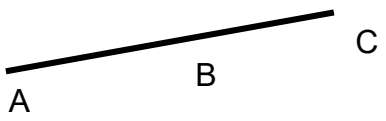
Other examples: Are the following statements Sometimes, Always, or Never true?

1) Points X and Y are in plane *z*. Any point collinear with X and Y is in plane *z*.

2) Two planes have an intersection of a line.

Paragraph Proof: It is acceptable to write a paragraph of a proof, rather than using two columns.

Example: Write a paragraph proof. If AB = 6 and BC = 6, then prove that B is the midpoint of AC.



Formal Geometry **2.3 and Constructions Guided Notes**

Inductive versus Deductive Reasoning:

Law of Detachment:

Law of Syllogism

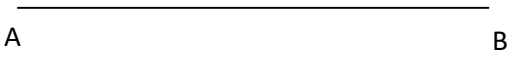
Example 1: Draw a conclusion. Which type of reasoning is used?
If Eduardo goes to a concert tonight, he will miss football practice. Tonight, Eduardo went to a concert.
Conclusion:

Example 2: Is the conclusion valid or invalid? If it is valid, what type of reasoning is used?
If two angles form a linear pair, then they are supplementary. If two angles are supplementary, then they have a sum of 180. **Conclusion:** If two angles form a linear pair, then they have a sum of 180.

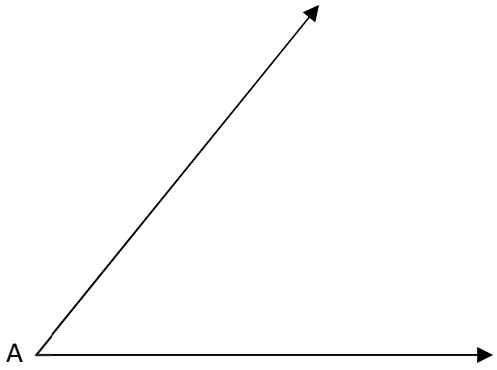
Example 2: Is the conclusion valid or invalid? If it is valid, what type of reasoning is used?
If two angles form a linear pair, then they are supplementary. If two angles are supplementary, then they have a sum of 180. **Conclusion:** If two angles have a sum of 180, then they are a linear pair.

Constructions:

1. Construct the bisector of $\overline{AB}$ ***(p.28)***

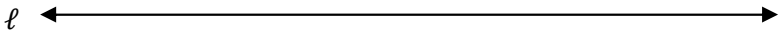


2. Construct the bisector of $\angle A$ ***(p.40)***



3. Copy $\overline{AB}$ from #1 ***(p.16)***

4. Copy $\angle A$ from #2 on line ℓ ***(p. 39)***



2.6 Guided Notes

For the following postulates, you may use their names in proofs.

Angle Addition Postulate: If D is in the interior of ∠ABC, then $m\angle ABD + m\angle DBC = m\angle ABC$.

For all of the theorems below, you must write out the entire theorem in words or symbols.

- If two angles form a linear pair, then they are supplementary angles.

- If two adjacent angles form a right angle, then they are complementary angles.

- If angles are supplementary to the same angle (or to congruent angles), then they are congruent.

- If angles are complementary to the same angle (or to congruent angles), then they are congruent.

- If two angles are vertical, then they are congruent.

- If two lines are perpendicular, then they form four right angles.

- If two angles are right angles, then they are congruent.

- If two lines are perpendicular, then they form congruent adjacent angles.

Complete the proofs from the Ch 2 Proofs Packet.

Solving examples:

1) The complement of the supplement of $\angle A$ is 37^{o}. Find the measure of $\angle A$.

2) $\angle A$ is complementary to $\angle B$, and $\angle C$ is complementary to $\angle A$. If $\angle B = (3x + 10)$ and $\angle C = (5x - 2)$, then find the measure of $\angle A$.