Unit 1 - Day 17L - Flowchart & Paragraph Proofs

Agenda

- Go over HW 1.16
- Notes - 1.17 - Colored Pencils!

HW

Problem Set Proof Packet- 1.17

Continue to Fill out Lesson Summaries and Axioms (due test day)

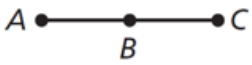
1-17L Note Sheet: Flowchart & Paragraph Proofs

Formats of Proofs

- Formal 2-Column Proofs: Statements are written in the left column with corresponding reasons written on the right.
- Flowchart Proofs: Boxes and arrows which show the structure of a proof are read left to right and top to bottom.
- Paragraph Proofs: Steps with their matching reasons are written as sentences.

Regardless of the format, *all logical thinking and reasoning* behind connections must be shown.

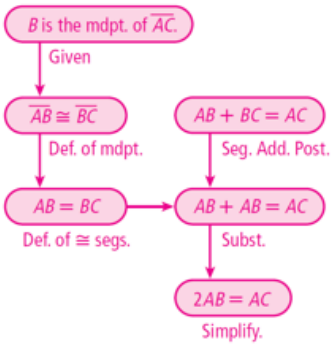
Example Given: B is the midpoint of $\overline{AC}$
Prove: 2(AB) = AC



2-Column

Statements	Reasons
1. B is the mdpt of $\overline{AC}$	1. Given
2. $\overline{AB} \cong \overline{BC}$	2. Defn midpoint → 2 ≅segments
3. AB=BC	3. $\cong \longleftrightarrow =$ *measure*
4. AB + BC = AC	4. Segment addition postulate
5. AB + AB = AC	5. Substitution (step 3 into 4)
6. 2(AB) = AC	6. Simplification

Flowchart

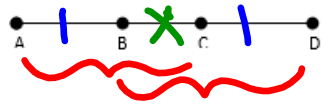


Paragraph

B is the midpoint of $\overline{AC}$ so $\overline{AB} \cong \overline{BC}$ since a midpoint creates two congruent segments. Then AB=BC since congruent segments have equal measure. By the segment addition postulate, AB+BC=AC. Then AB+AB=AC by substitution. Finally 2(AB)=AC by simplification.

Recall:

COMMON/OVERLAPPING SEGMENT THEOREM	COMMON/OVERLAPPING ANGLE THEOREM



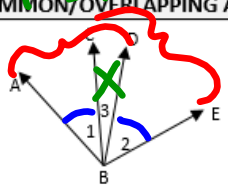
If A,B,C,D are collinear

Little → Big

$\overline{AB} \cong \overline{CD}$	Given
$\overline{BC} \cong \overline{BC}$	Reflexive
$\overline{AC} \cong \overline{BD}$	Common/Overlapping Segment Theorem

Big → Little

$\overline{AC} \cong \overline{BD}$	Given
$\overline{BC} \cong \overline{BC}$	Reflexive
$\overline{AB} \cong \overline{CD}$	Common/Overlapping Segment Theorem



If all angles share a common vertex and are adjacent

Little → Big

$\angle 1 \cong \angle 2$	Given
$\angle 3 \cong \angle 3$	Reflexive
$\angle ABD \cong \angle CBE$	Common/Overlapping Angle Theorem

Big → Little

$\angle ABD \cong \angle CBE$	Given
$\angle 3 \cong \angle 3$	Reflexive
$\angle 1 \cong \angle 2$	Common/Overlapping Angle Theorem

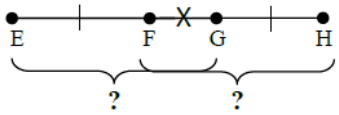
Both theorems require all three steps to be included

Complete Lesson Summary:

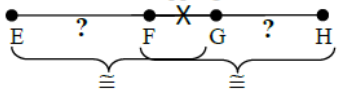
1-17 + See Axioms Pages

- Common/Overlapping Segment Theorem (Similar for Common Angle Theorem)

Given Littles ≅



Given Overlapping Pieces ≅



1)

2)

3)

1)

2)

3)

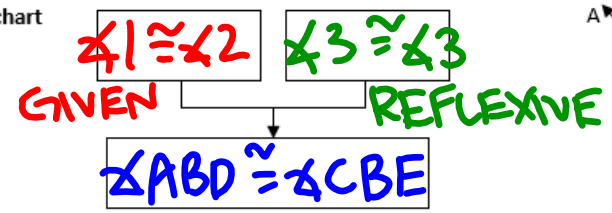
- Paragraph proofs consist of matches statements and their reasons in _____ often using "since _____, then _____".
- Flowchart proofs place statements in _____ with reasons underneath. Boxes are connected by _____ going left to right or top to bottom.

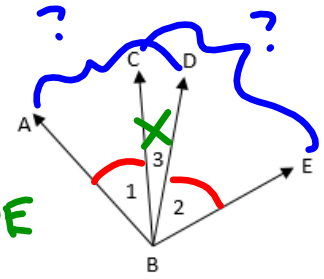
Using the Common/Overlapping Angle Theorem

Given: $\angle 1 \cong \angle 2$

Prove: $\angle ABD \cong \angle CBE$

Flowchart





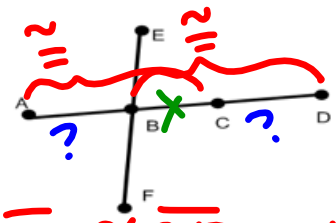
OVERLAPPING ANGLES THEOREM

Example 2 – Common/Overlapping Segment Theorem

Given: $\overline{AC} \cong \overline{BD}$

Prove: $\overline{AB} \cong \overline{CD}$

Paragraph Proof:



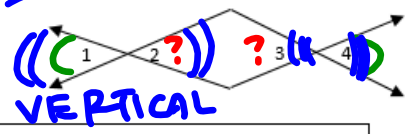
SINCE IT IS GIVEN THAT $\overline{AC} \cong \overline{BD}$ AND $\overline{BC} \cong \overline{BC}$ BY REFLEXIVE PROP, THEN $\overline{AB} \cong \overline{CD}$ BY THE OVERLAPPING SEGMENT THEOREM.

VERTICAL ANGLE PAIR CONGRUENCE THEOREM

Anytime you have VERTICAL ∠'S by looking at the diagram, you can ***deduce*** that they are CONGRUENT using "vertical angles are congruent".

Example: Given: $\angle 1 \cong \angle 4$

Prove: $\angle 2 \cong \angle 3$



Statements	Reasons
1. $\angle 1$ and $\angle 2$ are vertical angles $\angle 3$ and $\angle 4$ are vertical angles	1. DIAGRAM
2. $\angle 1 \cong \angle 2$; $\angle 3 \cong \angle 4$	2. VERTICAL ∠'S ARE ≅
3. $\angle 1 \cong \angle 4$	3. GIVEN
4. $\angle 2 \cong \angle 3$	4. SUBSTITUTION (STEP 2 INTO 3)

*Fill in Axioms for Common/Overlapping Segment/Angle Theorems and Vertical Angles