



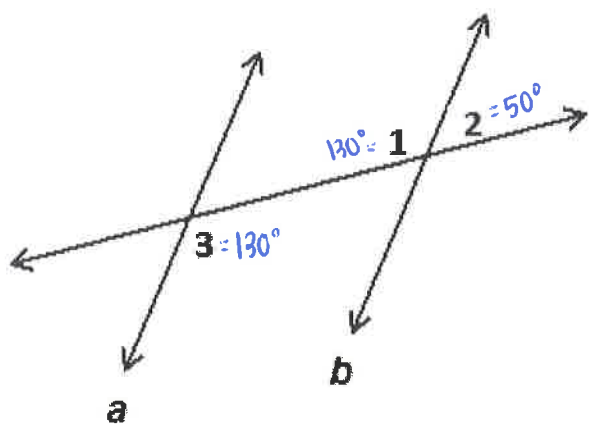
- I can write logical arguments using properties from algebra and geometry.

## REASON BANK

Addition Property  
Alternate Interior Angles Theorem  
Alternate Interior Angles Converse Theorem  
Alternate Exterior Angles Theorem  
Alternate Exterior Angles Converse Theorem  
Combine Like Terms  
Consecutive Interior Angles Theorem  
Consecutive Interior Angles Converse Theorem  
Corresponding Angles Postulate  
Corresponding Angles Converse Postulate

Division Property  
Distributive Property  
Given  
Linear Pair Postulate  
Multiplication Property  
Simplification  
Substitution Property  
Subtraction Property  
Transitive Property  
Vertical Angles Theorem

**Example 1:** Given  $m\angle 2 = 50^\circ$  and  $m\angle 3 = 130^\circ$ , Please prove  $a \parallel b$ .



Statements	Reasons
1. $m\angle 2 = 50^\circ, m\angle 3 = 130^\circ$	1. Given
2. $m\angle 1 + 50 = 180$	2. Linear Pair Postulate
3. $m\angle 1 = 130^\circ$	3. Subtraction prop.
4. $a \parallel b$	4. alternate interior angles <u>converse</u>

**Example 2:**

a. If  $AB = 8$ , and  $8 = CD$ , then  $AB = CD$ .

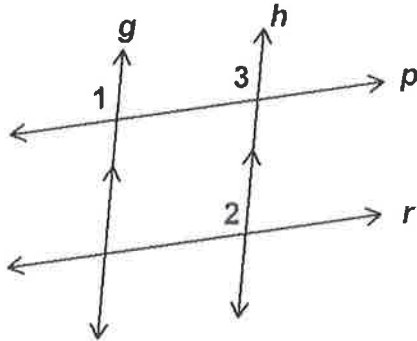
b. If  $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$  and  $\overleftrightarrow{EF} \parallel \overleftrightarrow{CD}$ , then  $\overleftrightarrow{AB} \parallel \overleftrightarrow{EF}$ .

\*To complete these statements, you used the transitive Property.

Transitive Property: If  $a = b$  and  $b = c$ , then  $a = c$ .

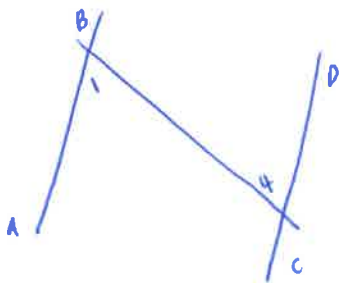
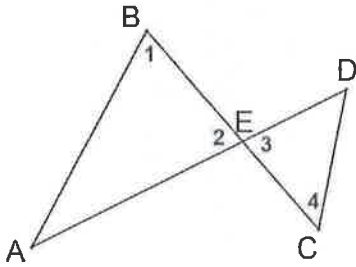
**Example 3: Using the Transitive Property in Proofs**

- a. Given:  $g \parallel h$  and  $\angle 1 \cong \angle 2$   
 Prove:  $p \parallel r$



Statements	Reasons
1) $g \parallel h$	1) Given
2) $\angle 1 \cong \angle 3$	2) corresponding angles postulate
3) $\angle 1 \cong \angle 2$	3) Given
4) $\angle 3 \cong \angle 2$	4) Transitive Property <small>→ cant use corr. angles b/c p is not // to r yet</small>
5) $p \parallel r$	5) corresponding angles <u>converse</u>

- b. Given:  $\angle 1 \cong \angle 2$  and  $\angle 3 \cong \angle 4$   
 Prove:  $\overline{AB} \parallel \overline{CD}$



Statements	Reasons
1) $\angle 1 \cong \angle 2$	1) Given
2) $\angle 2 \cong \angle 3$	2) VAT
3) $\angle 3 \cong \angle 4$	3) Given
4) $\angle 1 \cong \angle 4$	4) Transitive Property <small>↑ cant use alt. int. angles b/c lines are not // yet</small>
5) $\overline{AB} \parallel \overline{CD}$	5) alt. int. angles <u>converse</u>