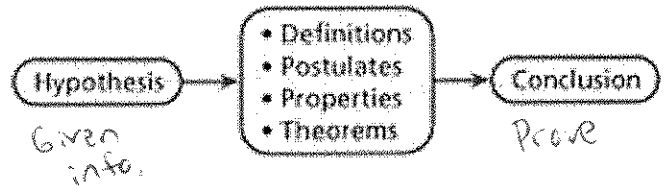


Objectives: Write two-column proofs. Prove geometric theorems by using deductive reasoning.

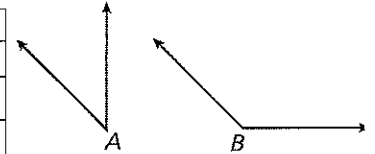
- When writing a geometric proof, you use **deductive reasoning** to create a chain of logical steps that move from the hypothesis to the conclusion.



Complete the following two-column proofs using some definitions from chapter 1.

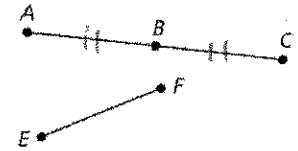
EX 1: Given: $\angle A$ and $\angle B$ are supplementary & $m\angle A = 45^\circ$. Prove: $m\angle B = 135^\circ$

#	Statements	Reasons
1.	$\angle A$ and $\angle B$ are supplementary	Given
2.	$m\angle A + m\angle B = 180^\circ$	Def. of supp. \angle s
3.	$m\angle A = 45^\circ$	Given
4.	$45^\circ + m\angle B = 180^\circ$	Sub. Prop.
5.	$m\angle B = 135^\circ$	Subt. Prop.



EX 2: Given: B is the midpoint of AC & $AB \cong EF$. Prove: $BC \cong EF$

#	Statements	Reasons
1.	B is the midpoint of AC	Given
2.	$AB \cong BC$	Def. of midpt.
3.	$AB \cong EF$	Given
4.	$BC \cong EF$	Transitive

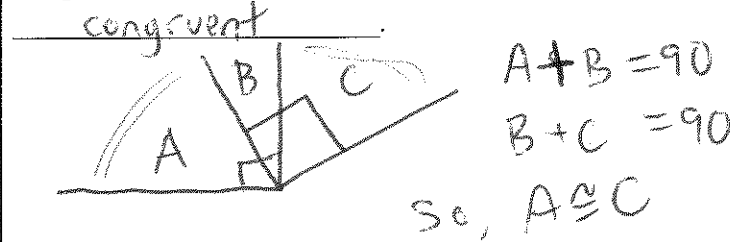


1) **Theorem:** any statement that you can prove. Once proven, you can use it as a **reason** in later proofs.

2) **Linear Pair Theorem:** If two angles form a linear pair, then they are supplementary.



3) **Congruent Complements Theorem:** If two angles are complementary to the same angle, then the two angles are congruent.

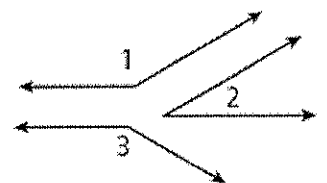


4) **Right Angle Congruence Theorem:** all right angles are congruent.

Complete the following two-column proof to prove a new theorem.

EX 3: Given: $\angle 1$ and $\angle 2$ are supplementary, and $\angle 2$ and $\angle 3$ are supplementary. Prove: $\angle 1 \cong \angle 3$

#	Statements	Reasons
1.	$\angle 1$ & $\angle 2$ are supp.	Given
2.	$\angle 2$ & $\angle 3$ are supp.	Given
3.	$m\angle 1 + m\angle 2 = 180$	Def. of supp. \angle s
4.	$m\angle 2 + m\angle 3 = 180$	Def. of supp. \angle s
5.	$m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$	Substitution Property
6.	$m\angle 1 = m\angle 3$	Subtraction Property
7.	$\angle 1 \cong \angle 3$	Def. of $\cong \angle$ s



5) **Congruent Supplements Theorem:** If 2 \angle s are supplementary to the same \angle , then the two angles are congruent.

~~$\angle 1 \cong \angle 3$~~ If $\angle A$ is supp. $\angle B$, and $\angle C$ is supp. $\angle B$, then $\angle A \cong \angle C$.