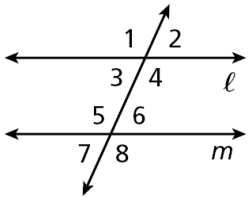
3-2A: Angles Formed by Parallel Lines and Transversals
"I WILL …
…prove and use theorems about the angles formed."
I. Definitions

A. _____ describes a fundamental relationship between the basic terms of geometry: Accepted to be true without proof

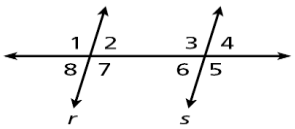
B. _____: A statement or conjecture that can be proven true by undefined terms, definitions and postulates.

Type of Theorem/Postulate	**Definition**	**Visual Example**
Converse of the Corresponding Angle Postulate	If two coplanar lines are cut by a transversal, so that a pair of corresponding angles are congruent, then the two lines are parallel	
Parallel Postulate	Through a point P and not on the line ℓ, there is exactly one line parallel to ℓ.	
Converse of the Alternate Interior Theorem	If two coplanar lines are cut by a transversal so that a pair of alt. interior angles are congruent, then the two lines are parallel.	
Converse of the Alternate Exterior Angles Theorem	If two coplanar lines are cut by a transversal so that a pair of alt. ext. angles are congruent, then the two lines are parallel.	
Converse of Same-Side Interior Angles Theorem	If two coplanar lines are cut by a transversal so that a pair of alt. same-side interior angles are supplementary, then the two lines are parallel.	

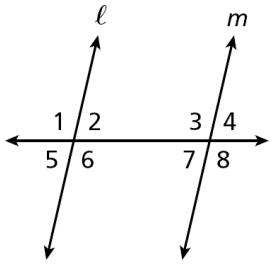
Ex 1: Use the Converse of the Corresponding Angles Postulate and the given information to show that $\ell \parallel m$ given $m\angle 3 = (4x - 80)°$, $m\angle 7 = (3x - 50)°$, $x = 30$ and convert it to a two-column proof



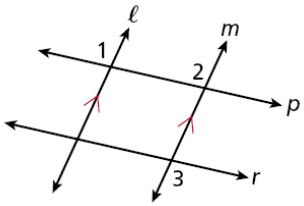
Ex 2: Use the Converse of the Corresponding Angles Postulate and the given information to show that $r \parallel s$ given $m\angle 2 = (10x + 8)°$, $m\angle 3 = (25x - 3)°$, $x = 5$ and convert it to a two-column proof



Your Turn: Use the Converse of the Corresponding Angles Postulate and the given information to show that $\ell \parallel m$ given $m\angle 7 = (4x + 25)°$, $m\angle 5 = (5x + 12)°$, $x = 13$ and convert it to a two-column proof

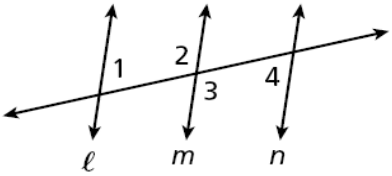


Ex 3: Using the diagram below, solve for $m\angle EDG$ and $m\angle BDG$



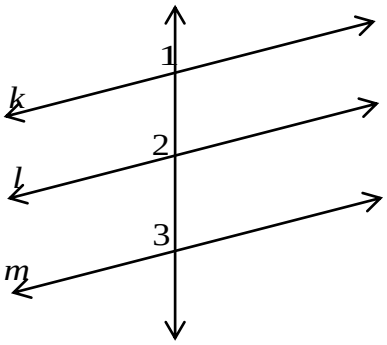
Statements	Reasons
1) $p \parallel r$	Given
2)	
3) $\angle 1 \cong \angle 3$	Given
4)	
5) $l \parallel m$	

Ex 4: Given: $\angle 1 \cong \angle 4$, $\angle 3$ and $\angle 4$ are supplementary.
Prove: $\ell \parallel m$

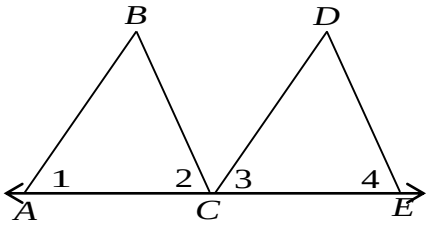


Statements	Reasons
1) $\angle 1 \cong \angle 4$	Given
2)	Def'n of Congurency
3) $\angle 3$ and $\angle 4$ are supplementary	Given
4)	
5)	
6)	
7) $m\angle 2 + m\angle 1 = 180°$	
8) $\ell \parallel m$	

Ex 5: Given: $\ell \parallel k$ and $m \parallel k$
Prove: $\ell \parallel m$



Your Turn: Given: $\overline{AB} \parallel \overline{CD}$, $\angle 1 \cong \angle 2$, $\angle 3 \cong \angle 4$
Prove: $\overline{BC} \parallel \overline{DE}$



Assignment: Pg. 166: 15, 19-21, 24-36 all