



- I can prove lines are parallel.
 - I can use the corresponding angles converse
 - I can use the alternate interior angles converse.
 - I can use the alternate exterior angles converse.
 - I can use the consecutive interior angles converse.

You may have noticed that the postulates and theorems that we've studied so far have been written in the form "If p , then q ." The **converse** of such a statement *switches the order of the parts of the statement* and has the form "If q , then p ." The **converse** of a postulate or theorem may or may not be true, just as the **converse** of a mathematical statement may or may not be true.

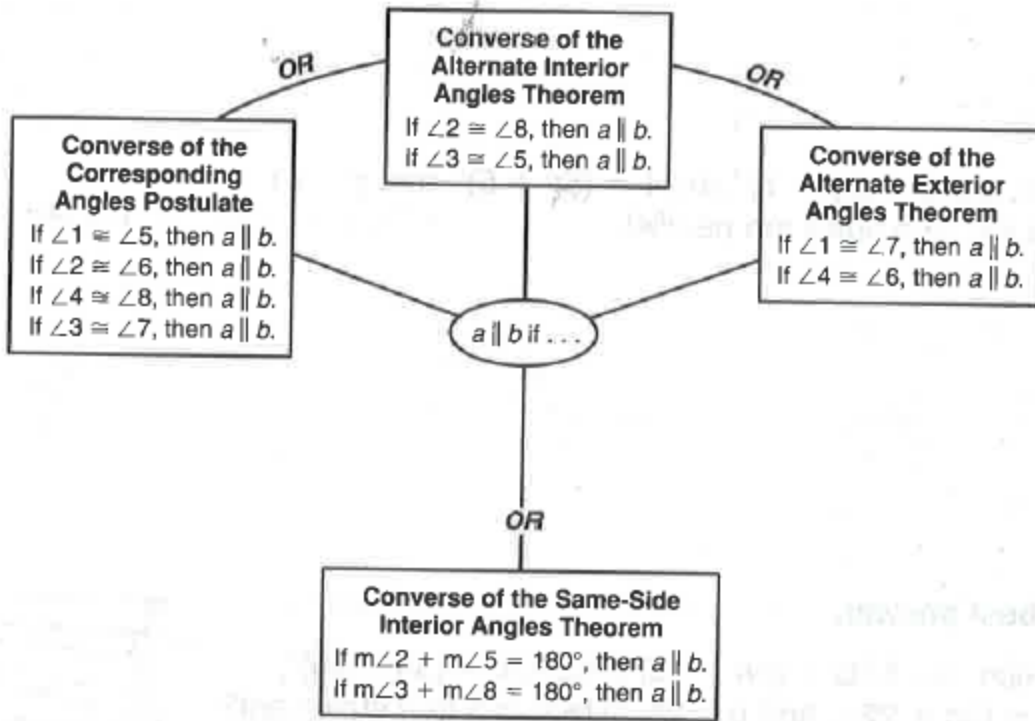
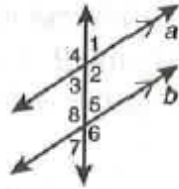
Mathematical Example:

Statement	Write the <i>converse</i> of the Statement	Is the converse <u>always</u> true?
If $x = 2$, then $3x = 6$		
If $x = 2$ and $y = 3$, then $x + y = 5$		

The **converse** of the Corresponding Angles Postulate is accepted as **true**, and this makes it possible to prove that the **converses** of the Alternate Interior Angle Theorem, Alternate Exterior Angle Theorem, and Consecutive Interior Angle Theorem are also true.

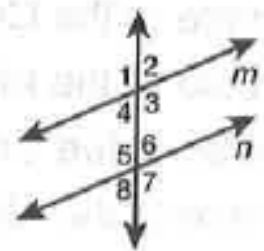
Converse	In words...	Diagram
Corresponding Angles Converse	If two lines are cut by a transversal so that corresponding angles are _____, then the lines are _____.	<p>If $\angle 1 \cong \angle 3$, then $q \parallel r$</p>
Alternate Interior Angles Converse	If two lines are cut by a transversal so that alternate interior angles are _____, then the lines are _____.	<p>If _____, then _____</p>
Alternate Exterior Angles Converse	If two lines are cut by a transversal so that alternate exterior angles are _____, then the lines are _____.	<p>If _____, then _____</p>
Consecutive Interior Angles Converse	If two lines are cut by a transversal so that consecutive interior angles are _____, then the lines are _____.	<p>If _____, then _____</p>

Line **a** and line **b** can be proven parallel four different ways.



For questions 1 – 4, use the given information to explain why $m \parallel n$.

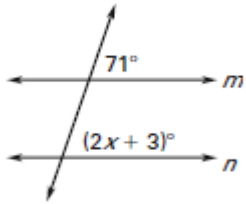
1. $\angle 1 \cong \angle 7$ _____
2. $m\angle 4 + m\angle 5 = 180^\circ$ _____
3. $\angle 5 \cong \angle 3$ _____
4. $\angle 8 \cong \angle 4$ _____



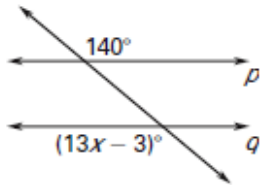
5. If $m\angle 1 = 47^\circ$ and $m\angle 5 = 49^\circ$, are the lines parallel? Explain.
6. If $m\angle 3 = 119^\circ$, what does the measure of $\angle 6$ need to be to prove $m \parallel n$?

Example 1: Find value of x that makes line parallel.

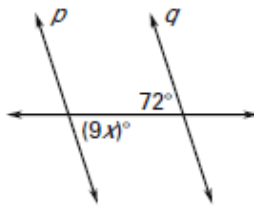
- a) Find the value of x that makes $m \parallel n$. Explain your reasoning.



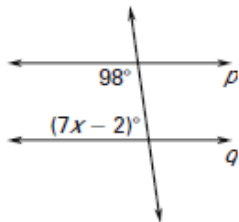
- b) Find the value of x that makes $p \parallel q$. Explain your reasoning.



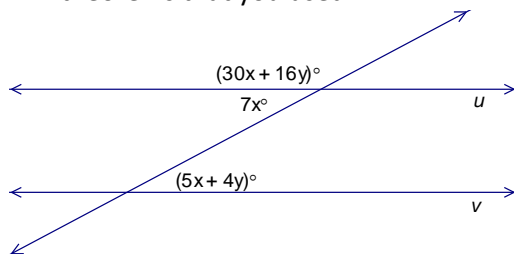
- c) Find the value of x that makes $p \parallel q$. Explain your reasoning.



- d) Find the value of x that makes $p \parallel q$. Explain your reasoning.



- e) Find the values of x and y that makes $u \parallel v$. Justify why $u \parallel v$ by stating the appropriate postulates or theorems that you used.



Example 2: Solve a Real- World Problem

- a) Noah needs to verify that the two posts (lines g and h) he's put into the ground are parallel. He measures the angles as shown in the diagram below. Is there enough information in the diagram to conclude that $g \parallel h$? Explain.

