Pop Quiz
Everything under your desk except scrap sheet of paper and pencil

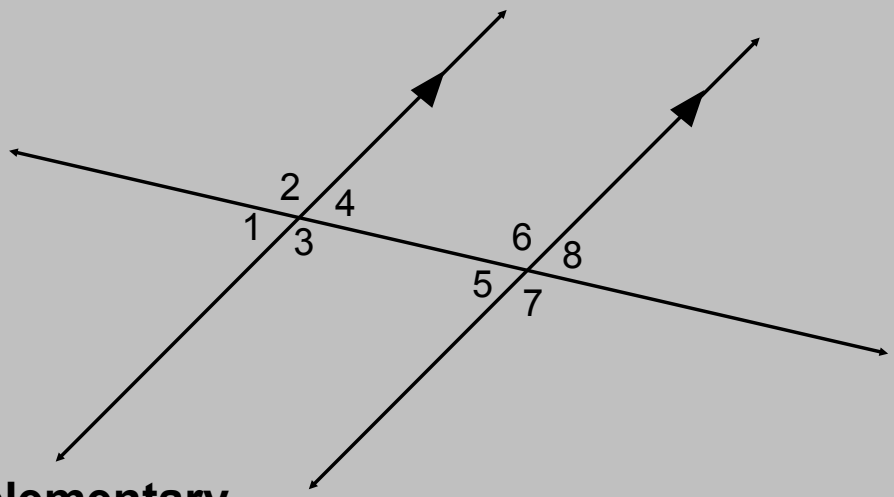
1. Write the Alternate Interior Angles Theorem.

2. Write the Consecutive Interior Angles Theorem.

3. Write the Vertical Angle Congruence Theorem.

Bellwork
09/28/2011

What theorem justifies each statement?



1. $\angle 3 \cong \angle 6$

2. $\angle 4 \cong \angle 6$ are supplementary.

3. If $m\angle 2 = 115^\circ$, find $m\angle 7$.

Geometry
3.3 Prove Lines are Parallel
Standard(s): 3,7

Vocabulary:

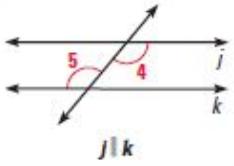
1. Paragraph Proof: A proof in paragraph form, written in sentences, using words to explain the logical flow of the argument.

THEOREMS — For Your Notebook

THEOREM 3.4 Alternate Interior Angles Converse

If two lines are cut by a transversal so the alternate interior angles are congruent, then the lines are parallel.

Proof: Example 3, p. 163

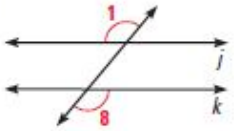


$j \parallel k$

THEOREM 3.5 Alternate Exterior Angles Converse

If two lines are cut by a transversal so the alternate exterior angles are congruent, then the lines are parallel.

Proof: Ex. 36, p. 168

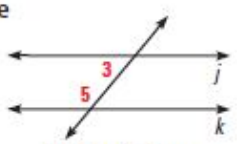


$j \parallel k$

THEOREM 3.6 Consecutive Interior Angles Converse

If two lines are cut by a transversal so the consecutive interior angles are supplementary, then the lines are parallel.

Proof: Ex. 37, p. 168

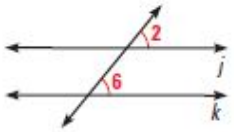


If $\angle 3$ and $\angle 5$ are supplementary, then $j \parallel k$.

POSTULATE — For Your Notebook

POSTULATE 16 Corresponding Angles Converse

If two lines are cut by a transversal so the corresponding angles are congruent, then the lines are parallel.



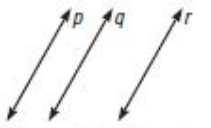
$j \parallel k$

THEOREM — For Your Notebook

THEOREM 3.7 Transitive Property of Parallel Lines

If two lines are parallel to the same line, then they are parallel to each other.

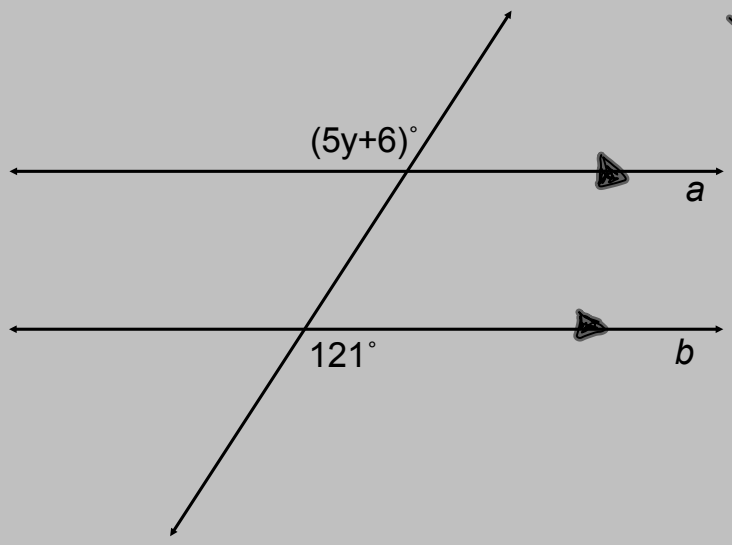
Proofs: Ex. 38, p. 168; Ex. 38, p. 177



If $p \parallel q$ and $q \parallel r$, then $p \parallel r$.

Apply the Corresponding Angles Converse

Find the value of *y* that makes *a*||*b*.

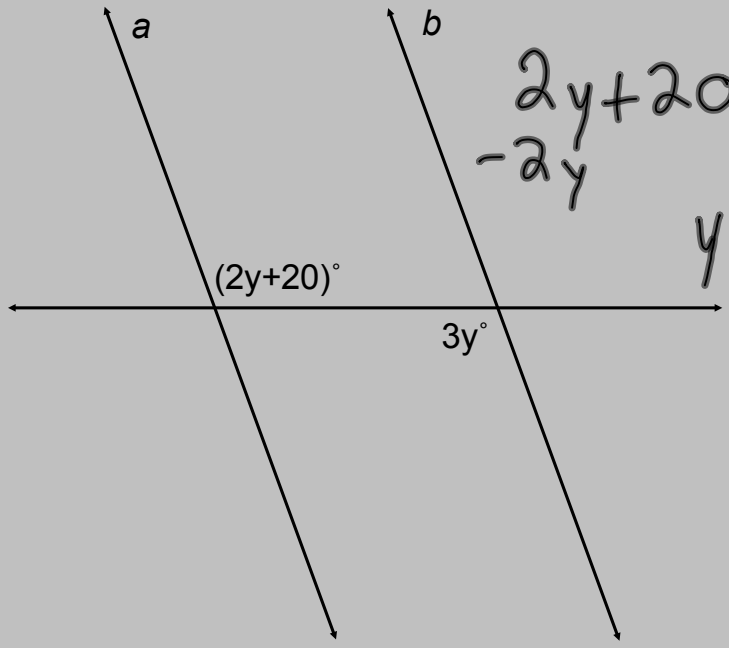


$5y+6=121$

$5y=115$

$y=23$

Alternate Interior



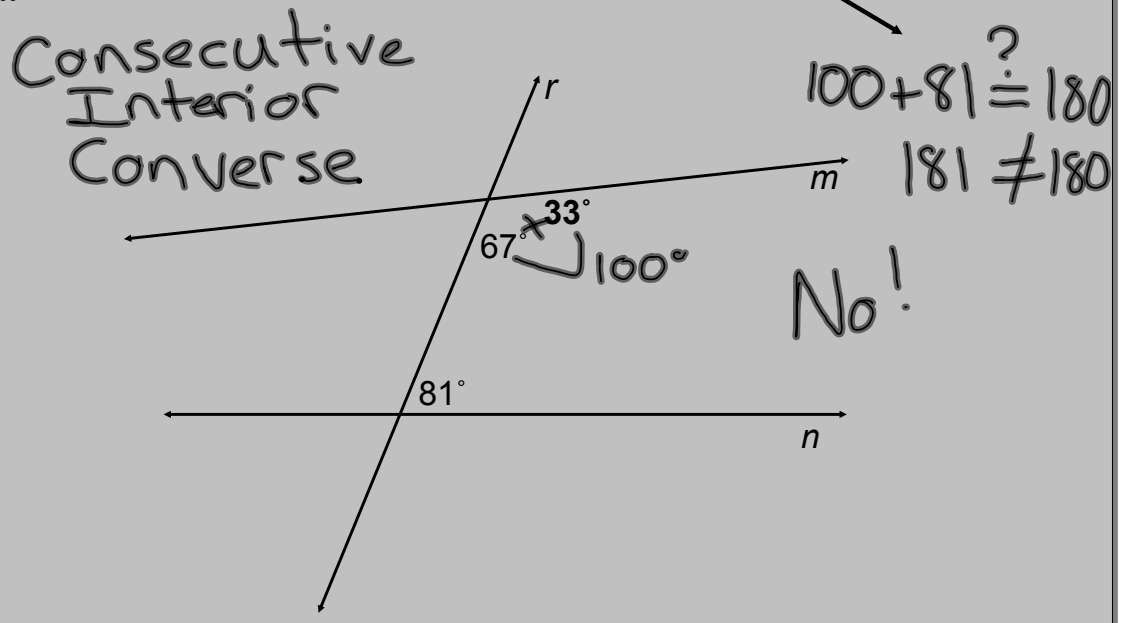
$2y+20=3y$

$-2y \quad -2y$

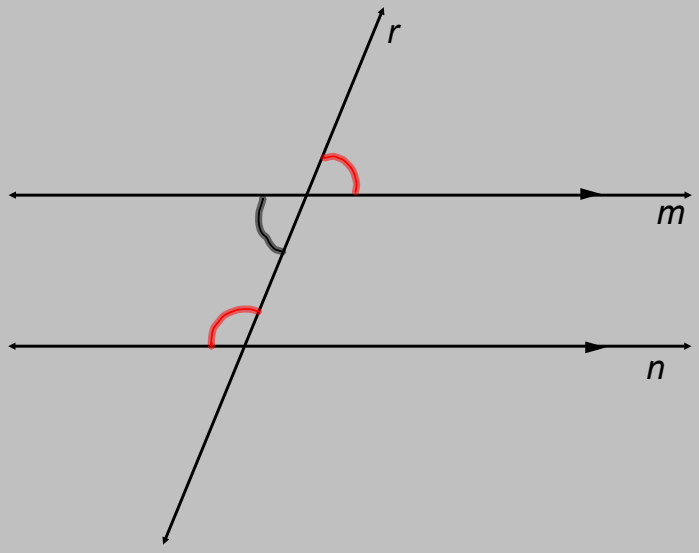
$y=20$

Proving Parallel Lines

Is there enough information in the diagram to conclude that m||n?



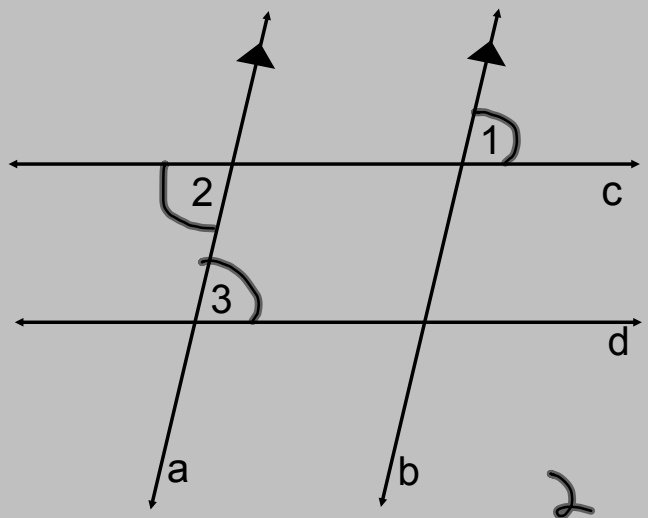
Just because the consecutive interior angles are congruent, does not mean they are supplementary. So, we cannot say the lines are parallel.



Write a Paragraph Proof

In the figure, a||b and ∠1 is congruent to ∠3. Prove c||d. Use a paragraph proof.

Pull



Given: $\angle 1 \cong \angle 3$
$a \parallel b$

Prove: $c \parallel d$

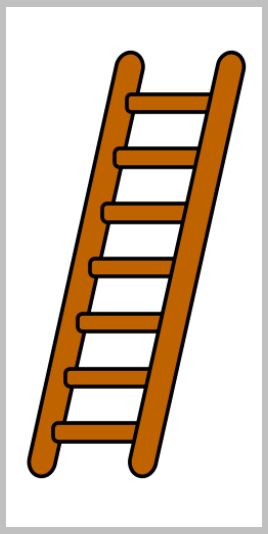
If $\angle 1 \cong \angle 3$ & $a \parallel b$, then $\angle 1 \cong \angle 2$ because of alternate exterior $\angle$'s theorem. Next, $\angle 2 \cong \angle 3$ because of Substitution prop. of $=$. Therefore, $c \parallel d$ because of Alternate Interior $\angle$'s Converse.

$\parallel$

Use the Transitive Property of Parallel Lines

In the figure each rung of the ladder is parallel to the rung directly above it. Explain why the top rung is parallel to the bottom rung.

Since the top rung is parallel to the next run. And the next rung is parallel to the next rung, etc. Then we can use the transitive property of parallel lines and say the top rung is parallel to the bottom rung.



Homework Assignment

Worksheet 3.3B