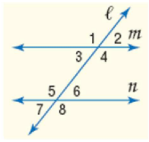
Objectives: *You will be able to recognize angle conditions that occur with parallel lines and prove theorems about parallel lines.*

Corresponding Angles Converse: If two lines are cut by a transversal, so the **corresponding** angles are congruent, then the lines are **parallel.**



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Alternate Interior Angles Converse: If two lines are cut by a transversal, so the **alternate interior angles** are congruent, then the two lines are **parallel.**

Alternate Exterior Angles Converse: If two lines are cut by a transversal, so the **alternate exterior angles** are congruent, then the two lines are **parallel.**

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Consective Interior Angles Converse: If two lines are cut by a transversal, so the **consecutive interior angles** are supplementary, then the two lines are **parallel.**

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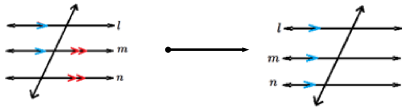
Transitive Property of Parallel Lines: If two lines are parallel to the same line, **then they are parallel to each other.**



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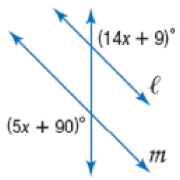
Example 1: Find the value of x so that $\ell \parallel m$.



$5x+90 = 14x+9$

$90 = 9x+9$

$81 = 9x$

$9 = x$

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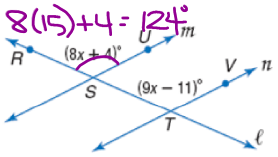
Example 2: Find the value of x and the $m\angle RSU$ so that $n \parallel m$.



$8(15)+4 = 124°$

$8x+4 = 9x-11$

$4 = x-11$

$15 = x$

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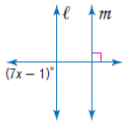
Example 3: Find the value of x so that $\ell \parallel m$.



$7x-1=90$

$7x=91$

$x=13$

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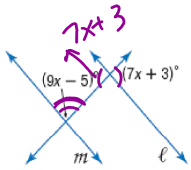
Example 4: Find the value of x that would make $\ell \parallel m$.



$9x-5+7x+3=180$

$16x-2=180$

$16x=182$

$x=11.375$

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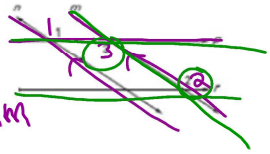
In Exercises 5–9, complete the two-column proof.

GIVEN: $n \parallel m$, $\angle 1 \cong \angle 2$

PROVE: $p \parallel r$



Statements	Reasons
$n \parallel m$	5 Given
$\angle 1 \cong \angle 3$	6 alt int ∠s thm
$\angle 1 \cong \angle 2$	7 Given
$\angle 2 \cong \angle 3$	8 transitive
$p \parallel r$	9 conv. of alt ext.

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