Properties of Parallel Lines Cut by a Transversal

Definitions

Parallel Lines: lines that do not intersect and are coplanar

Transversal: a line that intersects two or more lines in a plane at different points

Alternate Exterior Angles: two exterior angles found on different sides of a transversal

Alternate Interior Angles: two interior angles found on different sides of a transversal

Corresponding Angles: pair of interior and exterior angles found on the same side of a transversal

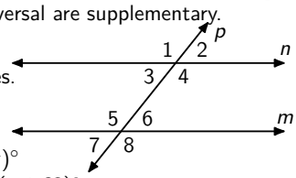
Parallel Postulates

1. If there is a line and a point not on the line, then there is exactly one line through the point that is parallel to the given line.
2. If two parallel lines are cut by a transversal, then the corresponding angles are equal.

Theorems

1. If two parallel lines are cut by a transversal, then alternate interior angles are equal.
2. If two parallel lines are cut by a transversal, then alternate exterior angles are equal.
3. If two parallel lines are cut by a transversal, then interior angles on the same side of the transversal are supplementary.
4. If two parallel lines are cut by a transversal, then exterior angles on the same side of the transversal are supplementary.

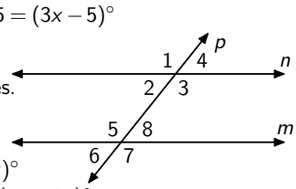
Practice Exercises



Find the measure of all eight angles.

1. If $m\angle 2 = 73°$
2. If $m\angle 3 = 82°$
3. If $m\angle 2 = x°$ and $m\angle 8 = (2x)°$
4. If $m\angle 4 = (2x)°$ and $m\angle 8 = (x+63)°$
5. If $m\angle 3 = (2x-5)°$ and $m\angle 5 = (3x-5)°$

Problem Set



Find the measure of all eight angles.

1. If $m\angle 2 = 78°$
2. If $m\angle 3 = 87°$
3. If $m\angle 2 = x°$ and $m\angle 8 = (3x)°$
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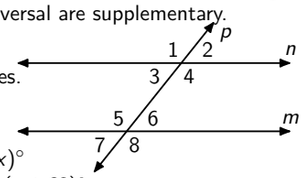

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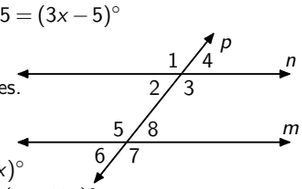

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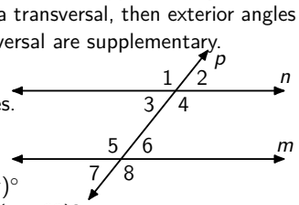

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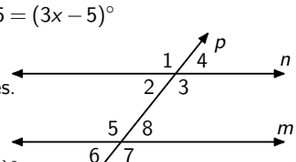

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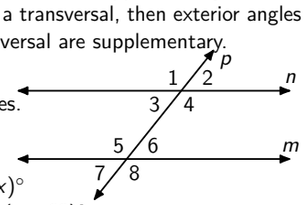

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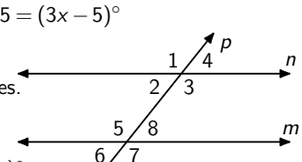

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