Properties of Parallel Lines Cut by a Transversal

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

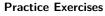
Corresponding Angles: pair of interior and exterior angles found on the same side of a transversal

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
- 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



Find the measure of all eight angles.

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

Problem Set

Find the measure of all eight angles.

- 1. If $m\angle 2 = 78^{\circ}$
- If $m \angle 3 = 87^{\circ}$
- 3. If $m\angle 2 = x^{\circ}$ and $m\angle 5 = (3x)^{\circ}$
- 4. If $m \angle 4 = (3x)^{\circ}$ and $m \angle 8 = (x+104)^{\circ}$
- 5. If $m \angle 3 = (x+10)^{\circ}$ and $m \angle 5 = (3x-6)^{\circ}$

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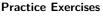
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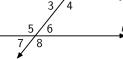
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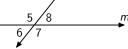


- If $m\angle 2 = x^{\circ}$ and $m\angle 8 = (2x)^{\circ}$
- If $m \angle 4 = (2x)^{\circ}$ and $m \angle 8 = (x + 63)^{\circ}$
- 5. If $m \angle 3 = (2x - 5)^{\circ}$ and $m \angle 5 = (3x - 5)^{\circ}$

Problem Set

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