LESSON 3-2
Review for Mastery
Angles Formed by Parallel Lines and Transversals

According to the Corresponding Angles Postulate, if two parallel lines are cut by a transversal, then the pairs of corresponding angles are congruent.

\[ \angle 1 \cong \angle 3 \quad \angle 2 \cong \angle 4 \]

Determine whether each pair of angles is congruent according to the Corresponding Angles Postulate.

1. \( \angle 1 \) and \( \angle 2 \)
2. \( \angle 3 \) and \( \angle 4 \)

Find each angle measure.

3. \( m\angle 1 \)
4. \( m\angle HJK \)

5. \( m\angle ABC \)
6. \( m\angle MPQ \)
LESSON 3-2
Review for Mastery
Angles Formed by Parallel Lines and Transversals continued

If two parallel lines are cut by a transversal, then the following pairs of angles are also congruent.

<table>
<thead>
<tr>
<th>Angle Pairs</th>
<th>Hypothesis</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>alternate interior angles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>alternate exterior angles</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If two parallel lines are cut by a transversal, then the pairs of same-side interior angles are supplementary.

Find each angle measure.

7. \( m\angle 3 \)

8. \( m\angle 4 \)

9. \( m\angle RST \)

10. \( m\angle MNP \)

11. \( m\angle WXZ \)

12. \( m\angle ABC \)
Find in the blanks to complete these theorems about angle pairs.

1. If two parallel lines are cut by a transversal, then the two pairs of corresponding angles are _____ congruent _____.

2. Congruent angles have ____ equal ____ measures.

Find each angle measure.

3. m\(\angle 1\) = 140°

4. m\(\angle 2\) = 70°

Find x.

5. $\angle x \equiv 15°$

6. $\angle y \equiv 75°$

Fill in the blanks to complete these theorems about angle pairs.

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

8. If two parallel lines are cut by a transversal, then the two pairs of same-side interior angles are supplementary.

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

Give two examples of each kind of angle pair in the figure.

10. Alternate interior angles

11. Alternate exterior angles

12. Same-side interior angles

Practice C

Angles Formed by Parallel Lines and Transversals

1. A parallelogram is a quadrilateral formed by two pairs of parallel lines. Use what you know about parallel lines and angle measures to find the sum of the measures of the four angles inside the parallelogram. Explain your answer.

Sample answer: m\(\angle 1\) + m\(\angle 2\) = 180° and m\(\angle 3\) + m\(\angle 4\) = 180° by the Same-Side Int. \(\triangle\) Thm. Thus, the total of the angle measures is 360°.

2. A trapezoid is a quadrilateral formed by one pair of parallel lines. Use what you know about parallel lines and angle measures to find the sum of the measures of the four angles inside the trapezoid. Write a two-column proof to justify your answer. (Hint: Draw BE parallel to AD and having E on CD. Write Construction to justify this step.)

Given: The sum of the measures of the angles in a triangle is 180°.

Prove: m\(\angle 1\) + m\(\angle 2\) + m\(\angle 3\) = 360°; sample answer:

<table>
<thead>
<tr>
<th>Statements</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Draw BE parallel to AD.</td>
<td>1. Construction</td>
</tr>
<tr>
<td>2. m(\angle 1) + m(\angle 2) = 180°, m(\angle 3) + m(\angle 4) = 180°</td>
<td>2. Same-Side Int. (\triangle) Thm.</td>
</tr>
<tr>
<td>3. m(\angle 1) + m(\angle 4) + m(\angle ABE) + m(\angle DEB) = 360°</td>
<td>3. Add. Prop. of =</td>
</tr>
<tr>
<td>4. m(\angle 3) + m(\angle CBE) + m(\angle ABE) + m(\angle CBE) = 180°</td>
<td>4. Given</td>
</tr>
<tr>
<td>5. m(\angle ABE) + m(\angle CBE) = 180°</td>
<td>5. Lin. Pair Thm.</td>
</tr>
<tr>
<td>6. m(\angle ABE) + m(\angle CBE) = m(\angle ABE) + m(\angle CBE)</td>
<td>6. Subst. (Steps 4, 5)</td>
</tr>
<tr>
<td>7. m(\angle ABE) + m(\angle CBE) = m(\angle DEB)</td>
<td>7. Subtr. Prop. of =</td>
</tr>
<tr>
<td>8. m(\angle 1) + m(\angle 3) + m(\angle ABE) + m(\angle CBE) = 360°</td>
<td>8. Subst. (Steps 3, 7)</td>
</tr>
<tr>
<td>9. m(\angle 2) = m(\angle ABE) + m(\angle CBE)</td>
<td>9. Angle Add. Post.</td>
</tr>
<tr>
<td>10. m(\angle 1) + m(\angle 2) + m(\angle 3) + m(\angle 4) = 360°</td>
<td>10. Subst. (Steps 8, 9)</td>
</tr>
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</table>

Review for Mastery

According to the Corresponding Angles Postulate, if two parallel lines are cut by a transversal, then the pairs of corresponding angles are congruent.

Determine whether each pair of angles is congruent according to the Corresponding Angles Postulate.

1. \(\angle 1\) and \(\angle 2\)

2. \(\angle 3\) and \(\angle 4\)

3. \(\angle 1\)

4. m\(\angle 1\)

5. m\(\angle 3\)

6. m\(\angle 5\)

Find each angle measure.

Prove: m\(\angle 1\) + m\(\angle 2\) + m\(\angle 3\) = 360°; sample answer:

Students are given a two-column proof to determine whether each pair of angles is congruent according to the Corresponding Angles Postulate.
Find each angle measure.

7. \( m \angle 3 \)  
   \[ 111^\circ \]

8. \( m \angle 4 \)  
   \[ 90^\circ \]

9. \( m \angle RST \)  
   \[ 138^\circ \]

10. \( m \angle MNP \)  
    \[ 56^\circ \]

11. \( m \angle WZX \)  
    \[ 130^\circ \]

12. \( m \angle ABC \)  
    \[ 118^\circ \]