Part 1 - Polygons Review

1) Answer the following questions about a regular decagon.
   a) How many sides does the polygon have? ________________________________
   b) What is the sum of the measures of the interior angles? ________________
   c) What is the measure of each interior angle? ___________________________
   d) What is the sum of the measures of the exterior angles? ________________
   e) What is the measure of each exterior angle? __________________________
   f) How many diagonals can be drawn in the polygon? ________________

2) Each exterior angle of a regular polygon is 90. Answer each question about the polygon.
   a) What is the sum of the exterior angles? ______________________________
   b) How many sides does the polygon have? _____________________________
   c) What is the name of the polygon? _________________________________
   d) What is the sum of the measures of the interior angles? _______________
   e) What is the measure of each interior angle? __________________________
   f) How many diagonals can be drawn in the polygon? ________________

3) The sum of the interior angles of a regular polygon is 540. Answer each question about the polygon.
   a) How many sides does the polygon have? ________________________________
   b) What is the name of the polygon? _________________________________
   c) What is the measure of each interior angle? __________________________
   d) What is the sum of the measures of the exterior angles? ________________
   e) What is the measure of each exterior angle? __________________________
   f) How many diagonals can be drawn in the polygon? ________________

Part 2 - Segments in Triangles - Give the most specific name for each dotted segment.
Part 3 - Determine whether the triangles are congruent. If they are, name the congruent triangles and the postulate or theorem you used. If there is not enough information, write none. Mark your diagrams.

1. \( AC \perp DB \)
2. \( KF \parallel HJ \)
   - \( G \) is the midpoint of \( FH \)
3. \( LM \parallel PN \)
   - \( LP \parallel MN \)
4. \( S \) is the midpoint of \( RT \)
5. \( FG \parallel JH \); \( FG \cong JH \)
6. \( AD \parallel BC \)
   - \( VT \) bisects \( \angle SVW \)
   - \( \angle S \cong \angle W \)
7. \( CB \cong DA \)
Part 4 - Solve each algebra connection problem. Answer all questions.

1. \[ \triangle ABC \]
   - Classify the triangle by its sides: _______________
   - What two sides are congruent? _________________
   - What two angles are congruent? ________________
   - \( x = \) ___________
   - \( m\angle A = \) ___________
   - \( m\angle C = \) ___________

2. \[ \triangle ABC \]
   - Classify the triangle by its sides: _______________
   - What two sides are congruent? _________________
   - What two angles are congruent? ________________
   - \( x = \) ___________
   - \( m\angle B = \) ___________
   - \( m\angle C = \) ___________
   - \( m\angle A = \) ___________

3. \[ \triangle ABC \]
   - \( m\angle A = \) ___________
   - Are any of the angles congruent? _______________
   - Therefore, are any of the sides congruent? _______
   - Classify the triangle by its sides: _______________
   - Classify the triangle by its angles: ______________
   - Order the side lengths from longest to shortest:
     - Longest: _____  Middle: _____  Shortest: _____

4. \[ \triangle ABC \]
   - \( x = \) ___________
   - \( m\angle A = \) ___________
   - \( m\angle B = \) ___________
   - \( m\angle C = \) ___________
   - Classify the triangle by its sides: _______________
   - Classify the triangle by its angles: ______________
### Given: B is the midpoint of CA;

- \( DC \cong DA \)

**Prove:** \( \angle 5 \cong \angle 6 \)

![Diagram of triangle with points A, B, C, D, and labels 1, 2, 3, 4, 5, 6]

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### Given: D is the midpoint of AB;

- \( CA \cong CB \)

**Prove:** \( CD \) bisects \( \angle ACB \)

![Diagram of triangle with points A, B, C, and D, and labels 1, 2, and 5]
Given: \( CD \) is a median of \( \triangle CAB \)
\( CD \perp AB \)

Prove: \( \angle 1 \cong \angle 2 \)

Given: \( AC \cong DB; \ \angle CAD \cong \angle BDA \)

Prove: \( CD \cong BA \)
<table>
<thead>
<tr>
<th>Statements</th>
<th>Reasons</th>
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<tbody>
<tr>
<td>Given: PR bisects $\angle QPS$ and $\angle QRS$</td>
<td>Prove: $RQ \parallel RS$</td>
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<tr>
<td>Given: $AB \parallel DC$; $AB \cong DC$</td>
<td>Prove: $AD \parallel BC$</td>
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## Optional

<table>
<thead>
<tr>
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<tr>
<td>Given: BD is an altitude of $\triangle ABC$</td>
<td>$AB \cong CB$</td>
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<tr>
<td>Prove: BD bisects $\angle ABC$</td>
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![Diagram of $\triangle ABC$ with BD as an altitude and bisector of $\angle ABC$]

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<tr>
<td>Given: $\angle C$ &amp; $\angle D$ are right angles; $AD \cong BC$</td>
<td>$AB \cong BC$</td>
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<td>Prove: $\triangle BAD \cong \triangle ABC$</td>
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![Diagram of $\triangle ABC$ with $\angle C$ and $\angle D$ as right angles and $AD \cong BC$]