Geometry - Chapter 4 Review

1. If $BCDE$ is congruent to $OPQR$, then $DE$ is congruent to $\text{?}$.
   A. $PQ$  
   B. $OR$  
   C. $OP$  
   D. $QR$

2. $\angle ABC \cong \text{?}$
   A. $\angle PMN$  
   B. $\angle NPM$  
   C. $\angle NMP$  
   D. $\angle MNP$

3. Which congruence statement does NOT necessarily describe the triangles shown if $\triangle DEF \cong \triangle FGH$?
   A. $\triangle EDF \cong \triangle GFH$  
   B. $\triangle FDE \cong \triangle FGH$  
   C. $\triangle EFD \cong \triangle GHF$  
   D. $\triangle FED \cong \triangle HGF$

4. Given $\triangle QRS \cong \triangle TUV$, $QS = 3v + 2$, and $TV = 7v - 6$, find the length of $QS$ and $TV$.
   A. 2  
   B. 9  
   C. 8  
   D. 20
5. In the paper airplane, $ABCD \cong EFGH$, $m\angle B = m\angle BCD = 90$, and $m\angle BAD = 131$. Find $m\angle GHE$.

A. 131  
B. 49  
C. 90  
D. 59

6. Use the information given in the diagram. Tell why $\overline{MN} \cong \overline{PO}$ and $\angle NOM \cong \angle PMO$.

A. Transitive Property, Reflexive Property  
B. Given, Given  
C. Reflexive Property, Transitive Property  
D. Given, Reflexive Property
7. Justify the last two steps of the proof.

Given: \( RS \cong UT \) and \( RT \cong US \)
Prove: \( \triangle RST \cong \triangle UTS \)

Proof:
1. \( RS \cong UT \) 1. Given
2. \( RT \cong US \) 2. Given
3. \( ST \cong TS \) 3. ?
4. \( \triangle RST \cong \triangle UTS \) 4. ?

A. Symmetric Property of \( \cong \); SSS  
B. Reflexive Property of \( \cong \); SAS  
C. Reflexive Property of \( \cong \); SSS  
D. Symmetric Property of \( \cong \); SAS

8. Name the angle included by the sides \( PN \) and \( NM \).

A. \( \angle N \)  
B. \( \angle P \)  
C. \( \angle M \)  
D. none of these
9. What other information do you need in order to prove the triangles congruent using the SAS Congruence Postulate?

A. \( \angle BAC \cong \angle DAC \)
B. \( \overline{AC} \perp \overline{BD} \)
C. \( \angle CBA \cong \angle CDA \)
D. \( \overline{AC} \cong \overline{BD} \)

10. Which triangles are congruent by ASA?

A. \( \triangle ABC \) and \( \triangle GFH \)
B. \( \triangle HGF \) and \( \triangle ABC \)
C. \( \triangle HGF \) and \( \triangle VTU \)
D. none
11. Which pair of triangles is congruent by ASA?
   A. [Image A]
   B. [Image B]
   C. [Image C]
   D. [Image D]

12. Name the theorem or postulate that lets you immediately conclude \( \triangle ABD \cong \triangle CBD \).
   A. AAS
   B. SAS
   C. ASA
   D. none of these

13. Can you use the SAS Postulate, the AAS Theorem, or both to prove the triangles congruent?
   A. either SAS or AAS
   B. SAS only
   C. AAS only
   D. neither
14. What else must you know to prove the triangles congruent by ASA? By SAS?

A. \( \angle ACD \cong \angle CAB; \overline{AB} \cong \overline{CD} \)  

B. \( \angle ACD \cong \angle CAB; \overline{AD} \cong \overline{BC} \)  

C. \( \angle ADC \cong \angle CAB; \overline{AD} \cong \overline{BC} \)  

D. \( \angle ACD \cong \angle CAB; \overline{AD} \cong \overline{AC} \)  

15. From the information in the diagram, can you prove \( \triangle FDG \cong \triangle FDE \)? Explain.

A. yes, by ASA  

B. yes, by AAA  

C. yes, by SAS  

D. no
16. Supply the missing reasons to complete the proof.

**Given:** \( \angle Q \cong \angle T \) and \( QR \cong TR \)

**Prove:** \( PR \cong SR \)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Reasons</th>
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<tbody>
<tr>
<td>1. ( \angle Q \cong \angle T ) and ( QR \cong TR )</td>
<td>1. Given</td>
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<tr>
<td>2. ( \angle PRQ \cong \angle SRT )</td>
<td>2. Vertical angles are congruent.</td>
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<tr>
<td>3. ( \triangle PRQ \cong \triangle SRT )</td>
<td>3. ( )</td>
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<tr>
<td>4. ( PR \cong SR )</td>
<td>4. ( )</td>
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A. ASA; Substitution  
B. SAS; Corresp. parts of \( \cong \Delta \) are \( \cong \).  
C. AAS; Corresp. parts of \( \cong \Delta \) are \( \cong \).  
D. ASA; Corresp. parts of \( \cong \Delta \) are \( \cong \).
17. Supply the reasons missing from the proof shown below.

Given: \( AB \cong AC, \angle BAD \cong \angle CAD \)

Prove: \( AD \) bisects \( BC \)

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<td>1. ( AB \cong AC )</td>
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<tr>
<td>2. ( \angle BAD \cong \angle CAD )</td>
<td>2. Given</td>
</tr>
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<td>3. ( AD \cong AD )</td>
<td>3. Reflexive Property</td>
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<tr>
<td>4. ( \triangle BAD \cong \triangle CAD )</td>
<td>4. ?</td>
</tr>
<tr>
<td>5. ( BD \cong CD )</td>
<td>5. ?</td>
</tr>
<tr>
<td>6. ( AD ) bisects ( BC )</td>
<td>6. Definition of segment bisector</td>
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A. ASA; Corresp. parts of \( \cong \triangle \) are \( \cong \).
B. SAS; Reflexive Property
C. SSS; Reflexive Property
D. SAS; Corresp. parts of \( \cong \triangle \) are \( \cong \).

18. What is the value of \( x \)?

\[ x^\circ \]

A. \( 68^\circ \)  
B. \( 62^\circ \)  
C. \( 112^\circ \)  
D. \( 124^\circ \)
19. Find the value of $x$. The diagram is not to scale.

Given: $\overline{RS} \cong \overline{ST}$, $m\angle RST = 7x - 54$, $m\angle STU = 8x$

A. 14  B. 152  C. 16  D. 19

20. Two sides of an equilateral triangle have lengths $x + 2$ and $-2x + 20$. Which could be the length of the third side: $14 - x$ or $2x + 4$?

A. $2x + 4$ only  C. $14 - x$ only
B. both $14 - x$ and $2x + 4$  D. neither $14 - x$ nor $2x + 4$

21. The legs of an isosceles triangle have lengths $x + 1$ and $-x + 7$. The base has length $3x - 3$. What is the length of the base?

A. 4  C. 3  
B. 6  D. cannot be determined

22. Find the values of $x$ and $y$.

A. $x = 44$, $y = 46$  C. $x = 90$, $y = 44$
B. $x = 46$, $y = 44$  D. $x = 90$, $y = 46$
23. Find the value of $x$. The diagram is not to scale.

$$\triangle SRT$$

- $\angle RST = (5x - 30)^\circ$
- $\angle RTS = 5x^\circ$

A. $x = 60$  
B. $x = 21$  
C. $x = 15$  
D. none of these

24. The octagon in the figure is equiangular and $\overline{AB} \cong \overline{AC}$. Find $m\angle ACB$.

A. 135  
B. 45  
C. 30  
D. 90

25. For which situation could you immediately prove $\triangle 1 \cong \triangle 2$ using the HL Theorem?

I.  
II.  
III.  

A. I only  
B. II only  
C. III only  
D. II and III
26. $RQ$ is a perpendicular bisector to $PS$ at $Q$ between $P$ and $S$. $\angle SPR \cong \angle PSR$. By which of the five congruence statements, HL, AAS, ASA, SAS, and SSS, can you immediately conclude that $\triangle PQR \cong \triangle SQR$?

A. HL, AAS, ASA, SAS, and SSS
B. HL and AAS
C. HL, AAS, and ASA
D. HL and ASA

27. What additional information will allow you to prove the triangles congruent by the HL Theorem?

A. $\angle A \cong \angle E$
B. $m\angle BCE = 90$
C. $AC \cong DC$
D. $AC \cong BD$

28. What common angle do $\triangle CDG$ and $\triangle FCE$ share?

A. $\angle C$
B. $\angle F$
C. $\angle E$
D. $\angle D$
29. Which overlapping triangles are congruent by ASA?

A. $\triangle ADC \cong \triangle EBC$
B. $\triangle ABE \cong \triangle CDA$
C. $\triangle ABE \cong \triangle DEA$
D. $\triangle ADC \cong \triangle EDA$

30. For the two quadrilaterals below, $\angle I \cong \angle M$, $\angle IJK \cong \angle MJK$, $\angle LJK \cong \angle NKJ$, and $\angle L \cong \angle N$. Complete this congruence statement for the two quadrilaterals.

$\square LKJI \cong \square \underline{?}$

31. Are the triangles congruent? Justify your answer.
32. Are \( \triangle ABC \) and \( \triangle CDA \) congruent? Justify your answer.

33. Based on the given information, can you conclude that \( \triangle QRS \cong \triangle TUV \)? Explain.
   
   Given: \( QR \cong TU \), \( QS \cong TV \), and \( \angle R \cong \angle U \)

34. Is there enough information to prove the two triangles congruent? If yes, write the congruence statement and name the postulate you would use. If no, write not possible and tell what other information you would need.
35. Write the missing reasons to complete the proof.

**Given:** $AB \cong CD$, $\angle A \cong \angle D$, and $AF \cong DE$

**Prove:** $\triangle FAC \cong \triangle EDB$

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<td>5. $AB + BC = CD + BC$</td>
<td>5. ?</td>
</tr>
<tr>
<td>6. $AC = BD$</td>
<td>6. Segment Addition Postulate</td>
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