1. What is the relationship between \( \angle w \) and \( \angle y \)?
(A) Alternate Interior Angles
(B) Corresponding Angles
(C) Same Side Interior Angles
(D) Vertically Opposite Angles

2. Given two parallel lines and a transversal, which pair of angles are equal?
(A) \( \angle A = \angle C, \angle B = \angle D \)
(B) \( \angle A = \angle E, \angle D = \angle H \)
(C) \( \angle C = \angle E, \angle D = \angle F \)
(D) \( \angle C = \angle D, \angle G = \angle H \)

3. Which figure illustrates that the two lines are NOT parallel given the two angle measures?
(A) Figure 1
(B) Figure 2
(C) Figure 3
(D) Figure 4

4. Given the two parallel lines, determine the measure of \( x \).
(A) \( x = 125^\circ \)
(B) \( x = 135^\circ \)
(C) \( x = 45^\circ \)
(D) \( x = 55^\circ \)
5. Given the two parallel lines, determine the value of \( x \).

\[ \begin{array}{c}
\text{x} \\
150^\circ
\end{array} \]

(A) 30°  (B) 50°  (C) 130°  (D) 150°

6. Determine the value of \( x \).

\[ \begin{array}{c}
34^\circ \\
35^\circ \\
x
\end{array} \]

(A) 34°  (B) 146°  (C) 35°  (D) 145°

7. What are the correct measures of the indicated measures?

\[ \begin{array}{c}
x \\
y 120^\circ \\
z
\end{array} \]

(A) \( \angle x = 60^\circ \), \( \angle y = 60^\circ \), \( \angle z = 120^\circ \)  
(B) \( \angle x = 60^\circ \), \( \angle y = 120^\circ \), \( \angle z = 60^\circ \)  
(C) \( \angle x = 120^\circ \), \( \angle y = 120^\circ \), \( \angle z = 60^\circ \)  
(D) \( \angle x = 120^\circ \), \( \angle y = 60^\circ \), \( \angle z = 120^\circ \)

8. Determine the measure of \( x \).

\[ \begin{array}{c}
75^\circ \\
65^\circ \\
x
\end{array} \]

(A) \( x = 40^\circ \)  
(B) \( x = 140^\circ \)  
(C) \( x = 105^\circ \)  
(D) \( x = 75^\circ \)

9. Determine the value of \( x \).

\[ \begin{array}{c}
4x + 20^\circ \\
2x + 60^\circ
\end{array} \]

(A) \( x = 10^\circ \)  
(B) \( x = 20^\circ \)  
(C) \( x = 30^\circ \)  
(D) \( x = 40^\circ \)
10. Determine the value of $x$. 

(A) $x = 5^\circ$  (B) $x = 15^\circ$  (C) $x = 10^\circ$  (D) $x = 30^\circ$

11. Determine the measure of $\angle A$. 

(A) $80^\circ$  (B) $60^\circ$  (C) $40^\circ$  (D) $20^\circ$

12. Determine the value of $x$. 

(A) $x = 10^\circ$  
(B) $x = 20^\circ$  
(C) $x = 40^\circ$  
(D) $x = 60^\circ$

13. Which represents the value of $x$? 

(A) $74^\circ$  (B) $64^\circ$  (C) $121^\circ$  (D) $59^\circ$

14. What is the sum of the measures of all the angles in a regular decagon (ten sided figure)? 

(A) $1800^\circ$  (B) $144^\circ$  (C) $180^\circ$  (D) $1440^\circ$

15. What is the measure of one interior angle in a regular hexagon (six sided figure)?

(A) $1080^\circ$  (B) $720^\circ$  (C) $180^\circ$  (D) $120^\circ$

16. How many sides are there in a convex polygon that has the sum of all its interior angles equal to $1260^\circ$?

(A) 10 sides  (B) 9 sides  (C) 8 sides  (D) 7 sides
17. Which additional piece of information would allow you to conclude that these triangles are congruent?

(A) AC = DF  (B) \( \angle C = \angle F \)  (C) AB = EF  (D) BC = EF

18. What can you deduce from the congruence statement \( \triangle ABC \cong \triangle DEF \)?

(A) AB = EF  (B) AC = EF  (C) BC = DE  (D) AC = DF

19. What can you deduce from the congruence statement \( \triangle ABC \cong \triangle PQR \)?

(A) \( \angle A = \angle R \)  (B) \( \angle B = \angle P \)  (C) \( \angle C = \angle R \)  (D) \( \angle C = \angle Q \)

20. Which congruence postulate shows that \( \triangle ABC \cong \triangle XYZ \)?

(A) Side – Side – Side Postulate  (B) Angle – Side – Angle Postulate

(C) Angle – Angle – Side Postulate  (D) Side – Angle – Side Postulate

21. Which piece of information is required to prove that \( \triangle ABC \cong \triangle DCB \) using the SAS postulate?

(A) \( AB = DC \)  (B) \( BC = CB \)

(C) \( AC = DB \)  (D) \( AB = DB \)

22. Determine the value of x.

\[
\begin{align*}
4x + 28^\circ &= 2x + 32^\circ
\end{align*}
\]
23. Determine the value of $x$ and then determine the measures of both $\angle DOG$ and $\angle DGM$.

\[ \triangle DOG \]

\[ \angle DOG = 80^\circ \]
\[ \angle DGM = 2x - 5^\circ \]
\[ \angle OGM = 3x + 45^\circ \]

24. Determine the value of $x$ and the measures of $\angle BCD$ and $\angle CDB$.

\[ \triangle BCD \]

\[ \angle BCD = 3x + 30^\circ \]
\[ \angle CDB = 110^\circ \]
\[ \angle BDC = x + 20^\circ \]

25. Determine the value of $x$ for each of the following diagrams.

(a) \[ \triangle ABC \]
\[ \angle BAC = x + 16^\circ \]
\[ \angle ABC = 78^\circ \]
\[ \angle BCA = x + 24^\circ \]

(b) \[ \parallel \text{lines} \]
\[ \angle 1 = 2x + 50^\circ \]
\[ \angle 2 = 5x + 14^\circ \]

(c) \[ \triangle DEF \]
\[ \angle DEF = 3x + 25^\circ \]
\[ \angle EDF = 20^\circ \]
\[ \angle FDE = x + 55^\circ \]

26. Determine the measure of the missing variables for the following diagram.

(a) \[ \triangle ABC \]
\[ \angle ABC = 80^\circ \]
\[ \angle BAC = 60^\circ \]
\[ \angle BCA = 45^\circ \]
\[ \angle BDC = 45^\circ \]
\[ \angle EDF = a \]
\[ \angle ECD = \text{variables} \]
27. Determine the measures of the missing variables for the following diagrams.

(a) \[ \begin{align*}
84^\circ & \quad y \quad z \\
62^\circ & \quad x 
\end{align*} \]

(b) \[ \begin{align*}
115^\circ & \quad p \\
q & \quad w 
\end{align*} \]

(c) \[ \begin{align*}
100^\circ & \quad x \\
40^\circ & \quad z 
\end{align*} \]

(d) \[ \begin{align*}
b & \quad a \\
c & \quad d \\
110^\circ 
\end{align*} \]

(e) \[ \begin{align*}
50^\circ & \quad R \quad Q \\
80^\circ & \quad P 
\end{align*} \]

28(a) Determine the measure of one interior angle in the regular octagon below.

(b) The sum of the measures of the interior angles of an unknown polygon is 1980°. Determine the number of sides of this polygon.

(c) The sum of the measures of all the interior angles of an unknown polygon is 1620°. Determine the number of sides in the unknown polygon.
29. Complete the following proof.

Given: WV \parallel YX
Prove: \angle USV = \angle STX

<table>
<thead>
<tr>
<th>Statement</th>
<th>Reason</th>
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<tbody>
<tr>
<td>WV \parallel YX</td>
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<tr>
<td>\angle WST = \angle USV</td>
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<td>\angle WST = \angle STX</td>
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<tr>
<td>\angle USV = \angle STX</td>
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30. Name the congruence postulate (SSS, SAS, ASA, or AAS) and give the congruence statement for the triangles.

(a) [Drawing of triangle ABC with points B, C, D, E, and F]
(b) [Drawing of triangle KNM with points K, L, and M]

31. Given: AB \parallel DE
AC = CE
Prove: \triangle ABC \cong \triangle EDC

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<tr>
<th>STATEMENT</th>
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32. Given: \( PR \perp SQ \)
    \( RS = RQ \)

Prove: \( \angle S = \angle Q \)

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SOLUTIONS

22. x = 20  23. x = 30, \( \angle \text{DOG} = 55^\circ \), \( \angle \text{DGM} = 135^\circ \)  24. x = 15, \( \angle \text{BCD} = 75^\circ \), \( \angle \text{CDB} = 35^\circ \)
25(a) x = 31  (b) x = 12  (c) x = 25  26. a = 45°, b = 55°, c = 55°, d = 135°, e = 45°, f = 65°
27(a) x = 34°, y = 62°, z = 34°  (b) p = 65°, q = 50°, w = 65°  (c) x = 80°, y = 40°, z = 60°
27(d) a = 110°, b = 110°, c = 70°, d = 70°  (e) p = 80°, q = 130°, r = 50°
28(a) sum = 135°  (b) n = 13 sides  (c) n = 11 sides
29.  
<table>
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<td>( \angle \text{WST} = \angle \text{USV} )</td>
<td>Vertically Opposite Angles (X)</td>
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<td>( \angle \text{WST} = \angle \text{STX} )</td>
<td>Alternate Interior Angles (Z)</td>
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<tr>
<td>( \angle \text{USV} = \angle \text{STX} )</td>
<td>Transitive Property</td>
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30(a) ASA postulate, \( \Delta \text{BCD} \cong \Delta \text{FED} \)  (b) SAS postulate, \( \Delta \text{NLK} \cong \Delta \text{NLM} \)
31.  
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<td>2. ( \text{AC} = \text{CE} )</td>
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<td>3. ( \angle \text{ABC} = \angle \text{EDC} )</td>
<td>3. Alternate Interior Angles (Z)</td>
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<td>4. ( \angle \text{ACB} = \angle \text{ECD} )</td>
<td>4. Vertically Opposite Angles (X)</td>
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<td>5. ( \Delta \text{ABC} \cong \Delta \text{EDC} )</td>
<td>5. AAS</td>
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<td>1. Given</td>
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<tr>
<td>2. ( \angle \text{SRP} = \angle \text{QRP} )</td>
<td>2. Both angles equal 90°</td>
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<tr>
<td>3. ( \overline{\text{RS}} = \overline{\text{RQ}} )</td>
<td>3. Given</td>
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<tr>
<td>4. ( \overline{\text{PR}} = \overline{\text{PR}} )</td>
<td>4. Same Side</td>
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<tr>
<td>5. ( \Delta \text{SRP} \cong \Delta \text{QRP} )</td>
<td>5. SAS</td>
</tr>
<tr>
<td>6. ( \angle \text{S} = \angle \text{Q} )</td>
<td>6. Definition of Congruent Triangles</td>
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