1. Which of the following is a triangle?
   a. 3 cm, 4 cm, 5 cm  
   b. 4 cm, 5 cm, 9 cm  
   c. 5 cm, 6 cm, 12 cm  
   d. 9 cm, 9 cm, 22 cm

2. Given the diagram below.

   ![Diagram of a triangle with angles 57°, 67°, and 57°]

   What’s wrong with this picture? Explain your reasoning.
Problems 3 – 13 Calculate the measure of each lettered angle.

\[ \overline{AD} \cong \overline{AE} \text{ and } \overline{DE} \parallel \overline{HI} \]

3. a. _____
4. b. _____
5. c. _____
6. d. _____
7. e. _____
8. f. _____
9. g. _____
10. h. _____
11. i. _____
12. j. _____
13. k. _____
14. The streets that Jorge's house, school and mall are on form a triangle. The school’s intersection forms a 55° angle and the mall’s intersection forms a 53° angle. Which path, House to School, School to Mall, or Mall to House, is the longest that Jorge has to take?

Longest path for Jorge ________________

15. Given the diagram

Find the value of angle $x$.

$x$ __________
16. Given the diagram below

Determine whether \( \triangle ABC \cong \triangle EDC \). If they are congruent name the congruence shortcut. If they are not congruent write, “cannot be determined.”

Congruence Shortcut __________

17. Given the diagram below

Determine whether \( \triangle FGH \cong \triangle HIF \). If they are congruent name the congruence shortcut. If they are not congruent write, “cannot be determined.”

Congruence Shortcut __________
18. Given the diagram below

\[
\begin{array}{c}
\text{Determine whether } \triangle JKL \cong \triangle MNO. \text{ If they are congruent name the congruence shortcut. If they are not congruent write, “cannot be determined.”}
\end{array}
\]

Congruence Shortcut _________

19. Given the diagram.

\[
\begin{array}{c}
\text{Is } \overline{AB} \cong \overline{DE} \text{? Explain}
\end{array}
\]
20. Given the diagram

Is $\overline{AB} \cong \overline{FE}$? Explain.


**Given:** $\triangle ABC$ with $\angle A \cong \angle C$ and $\overline{BD}$ is an angle bisector.

**Prove:** $\triangle ABC$ is an isosceles triangle

```
BD is an angle bisector

21. $\angle 1 \cong \angle \underline{\hspace{1cm}}$

22. 

23. $\angle A \cong \angle \underline{\hspace{1cm}}$

24. 

Given

25. $\triangle \underline{\hspace{1cm}} \cong \triangle \underline{\hspace{1cm}}$

26. 

27. 

28. $\triangle ABC$ is an \underline{\hspace{1cm}}

29. 
```
30. \( \triangle ABC \) is isosceles with \( AB \cong BC \). The perimeter is 110 cm, and \( AB = 44 \) cm.

What is the length of \( AD \)? \( AD = \) _________

31. \( \triangle ABC \) is isosceles with \( AB \cong AC \).

Find the measure of \( \angle 2 \) _________

32. \( ABCD \) is a parallelogram.

What is the measure of \( \angle BDA \)?
   A. 32°
   B. 52°
   C. 84°
   D. 94°
33. Arrange the sides of the triangle in order from greatest value to least value

\[ \triangle ABC \]

- A. a, b, c
- B. b, c, a
- C. c, b, a
- D. a, c, b

34. \( \overline{AD} \cong \overline{CB} \) and \( \overline{CD} \cong \overline{AB} \).

From this information, which of the following reasons could be used to prove \( \triangle ABD \cong \triangle CDB \)?

- A. AAS
- B. ASA
- C. SSS
- D. SAS
35. \(BC\) bisects \(AD\) and \(AB \parallel DC\).

From this information, which of the following reasons could be used to prove \(\triangle ABE \cong \triangle DCE\)?

A. ASA
B. SSS
C. SAS
D. Cannot Be Determined

36. Given the diagram below

Which of the following statement is true

A. \(DE > EC\)
B. \(DE = EC\)
C. \(DE < EC\)
D. \(DC = BA\)
Problems 37 – 40  Find the missing measurements.

37. \( e = \) _____

38. \( f = \) _____

39. \( g = \) _____

40. \( h = \) _____
### ANSWER KEY

<table>
<thead>
<tr>
<th>Problem Number</th>
<th>Answer</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Since the triangle is an isosceles triangle, the base angles must be congruent. However, if this was true, then the sum of the angles of the triangle shown would be 181° and not 180°.</td>
<td>MA.912.G.4.4</td>
</tr>
<tr>
<td>3.</td>
<td>a. 31°</td>
<td>MA.912.G.2.2</td>
</tr>
<tr>
<td>4.</td>
<td>b. 121°</td>
<td>MA.912.G.2.2</td>
</tr>
<tr>
<td>5.</td>
<td>c. 28°</td>
<td>MA.912.G.2.2</td>
</tr>
<tr>
<td>6.</td>
<td>d. 59°</td>
<td>MA.912.G.2.2</td>
</tr>
<tr>
<td>7.</td>
<td>e. 59°</td>
<td>MA.912.G.2.2</td>
</tr>
<tr>
<td>8.</td>
<td>f. 31°</td>
<td>MA.912.G.2.2</td>
</tr>
<tr>
<td>9.</td>
<td>g. 90°</td>
<td>MA.912.G.2.2</td>
</tr>
<tr>
<td>10.</td>
<td>h. 41°</td>
<td>MA.912.G.2.2</td>
</tr>
<tr>
<td>11.</td>
<td>i. 80°</td>
<td>MA.912.G.2.2</td>
</tr>
<tr>
<td>12.</td>
<td>j. 49°</td>
<td>MA.912.G.2.2</td>
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<tr>
<td>13.</td>
<td>k. 59°</td>
<td>MA.912.G.2.2</td>
</tr>
<tr>
<td>14.</td>
<td>School to Mall</td>
<td>MA.912.G.4.7</td>
</tr>
<tr>
<td>15.</td>
<td>65°</td>
<td>MA.912.G.2.2</td>
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<tr>
<td>16.</td>
<td>SAA</td>
<td>MA.912.G.4.6</td>
</tr>
<tr>
<td>17.</td>
<td>SSS</td>
<td>MA.912.G.4.6</td>
</tr>
<tr>
<td>18.</td>
<td>Cannot be determined</td>
<td>MA.912.G.4.6</td>
</tr>
<tr>
<td>19.</td>
<td>No, AAA is not a congruence shortcut and therefore cannot be used to prove that</td>
<td>MA.912.G.8.5</td>
</tr>
<tr>
<td>20.</td>
<td>Yes, since ( \Delta ABC ) is proved by SAA, then ( \Delta ABC ) is an isosceles triangle because CPCTC.</td>
<td>MA.912.G.8.5</td>
</tr>
<tr>
<td>21.</td>
<td>( \angle 2 )</td>
<td>MA.912.G.8.5</td>
</tr>
<tr>
<td>22.</td>
<td>Definition of Angle Bisector</td>
<td>MA.912.G.8.5</td>
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<tr>
<td>23.</td>
<td>( \angle C )</td>
<td>MA.912.G.8.5</td>
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<tr>
<td>24.</td>
<td>( \overline{BD} \cong \overline{BD} )</td>
<td>MA.912.G.8.5</td>
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<tr>
<td>25.</td>
<td>( \Delta ABD \cong \Delta CBD )</td>
<td>MA.912.G.8.5</td>
</tr>
<tr>
<td>26.</td>
<td>SAA</td>
<td>MA.912.G.8.5</td>
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<tr>
<td>27.</td>
<td>CPCTC</td>
<td>MA.912.G.8.5</td>
</tr>
<tr>
<td>28.</td>
<td>( \Delta ABC ) is an isosceles triangle</td>
<td>MA.912.G.8.5</td>
</tr>
<tr>
<td></td>
<td>Answer</td>
<td>MA.912.G.</td>
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<tr>
<td>29.</td>
<td>Definition of Isosceles Triangle</td>
<td>8.5</td>
</tr>
<tr>
<td>30.</td>
<td>22</td>
<td>2.3</td>
</tr>
<tr>
<td>31.</td>
<td>90°</td>
<td>2.2</td>
</tr>
<tr>
<td>32.</td>
<td>A. 32°</td>
<td>2.2</td>
</tr>
<tr>
<td>33.</td>
<td>D. a,c,b</td>
<td>4.7</td>
</tr>
<tr>
<td>34.</td>
<td>C. SSS</td>
<td>4.6</td>
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<tr>
<td>35.</td>
<td>A. ASA</td>
<td>4.6</td>
</tr>
<tr>
<td>36.</td>
<td>A. BE &gt; EC</td>
<td>4.7</td>
</tr>
<tr>
<td>37.</td>
<td>125°</td>
<td>2.2</td>
</tr>
<tr>
<td>38.</td>
<td>90°</td>
<td>2.2</td>
</tr>
<tr>
<td>39.</td>
<td>55°</td>
<td>2.2</td>
</tr>
<tr>
<td>40.</td>
<td>8 cm</td>
<td>2.3</td>
</tr>
</tbody>
</table>