B. A triangle has sides that measure 11 cm and 16 cm. What are the possible lengths of the third side?

13, 14, 16

SOLUTION

\[ x + 11 > 16 \]
\[ x > 5 \]
\[ x + 16 > 11 \text{ Always true} \]
\[ 11 + 16 > x \]
\[ 27 > x \]
\[ 5 < x < 27 \]
Inequalities in One Triangle

**THEOREMS 5-9 AND 5-10**

- The longest side is opposite the largest angle.
- The shortest side is opposite the smallest angle.

\[
ZY < XZ < XY \\
m\angle X < m\angle Y < m\angle Z
\]

**THEOREM 5-11** Triangle Inequality Theorem

The sum of the lengths of any two sides is greater than the length of the third side.

\[
\begin{align*}
5 + 8 &> 11 \\
5 + 11 &> 8 \\
8 + 11 &> 5
\end{align*}
\]
Identify the angles of $\triangle FGH$. SEE EXAMPLE 2.

18. Which angle is the smallest?

19. Which angle is the largest?
Identify the sides of $\triangle NOP$. See Examples 3 and 4.

20. Which side is the longest?

21. Which side is the shortest?
Determine whether the side lengths could form a triangle.  **SEE EXAMPLE 5.**

22. 13, 15, 9

23. 8, 15, 7

24. 35, 20, 11

25. 65, 32, 40
Given two sides of a triangle, determine the range of possible lengths of the third side. SEE EXAMPLE 5.

26. 10 in. and 12 in.

27. 5 ft and 10 ft

28. 200 m and 300 m

29. 90 km and 150 km