

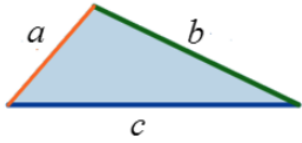
**Try this:**

Can you form a triangle with side lengths 2, 4, and 10? Try to sketch it.

\_\_\_\_\_

10

**Theorem:**

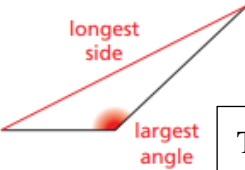
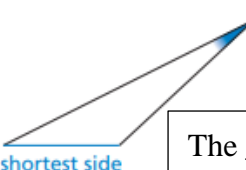
|  |   |          |         |         |          |          |         |         |         |          |
|--|---|----------|---------|---------|----------|----------|---------|---------|---------|----------|
| <p style="text-align: center;"><b>Triangle Inequality Theorem</b></p> <p style="text-align: center;"><i>The sum of the lengths of any two sides of a triangle is greater than the length of the third side.</i></p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="text-align: left;"> <math>a + b &gt; c</math><br/> <math>a + c &gt; b</math><br/> <math>b + c &gt; a</math> </div> </div> | <p><b>Determine which side lengths can form a triangle. Circle the ones that work.</b></p> <table style="width: 100%; border: none;"> <tr> <td style="padding: 5px;">3, 4, 5</td> <td style="padding: 5px;">3, 4, 8</td> <td style="padding: 5px;">8, 2, 6</td> </tr> <tr> <td style="padding: 5px;">12, 3, 8</td> <td style="padding: 5px;">4, 12, 9</td> <td style="padding: 5px;">5, 5, 5</td> </tr> <tr> <td style="padding: 5px;">2, 1, 3</td> <td style="padding: 5px;">4, 5, 6</td> <td style="padding: 5px;">6, 11, 7</td> </tr> </table> | 3, 4, 5  | 3, 4, 8 | 8, 2, 6 | 12, 3, 8 | 4, 12, 9 | 5, 5, 5 | 2, 1, 3 | 4, 5, 6 | 6, 11, 7 |
| 3, 4, 5  | 3, 4, 8   | 8, 2, 6  |         |         |          |          |         |         |         |          |
| 12, 3, 8   | 4, 12, 9  | 5, 5, 5  |         |         |          |          |         |         |         |          |
| 2, 1, 3  | 4, 5, 6   | 6, 11, 7 |         |         |          |          |         |         |         |          |

**Examples:**

A triangle has side lengths 9 and 14. Determine the range of values that are possible for the third side.

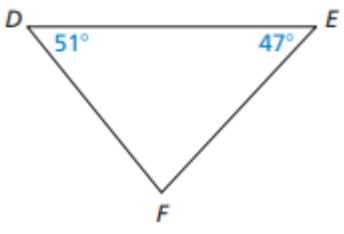
A triangle has side lengths 5 and 6. Determine the range of values that are possible for the third side.

**Key Concept:**

|   |  |
|---|--|
|  <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">                 The _____ side is opposite the _____ angle.             </div> |  <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">                 The _____ side is opposite the _____ angle.             </div> |
|---|--|

**Examples:**

List the sides of  $\triangle DEF$  in order from shortest to longest.



List the angles of  $\triangle ABC$  in order from smallest to largest.

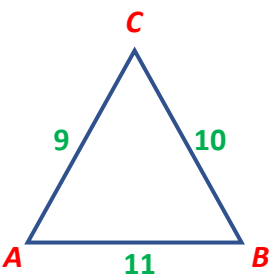


Figure may not be drawn to scale.