Exploring Triangle Inequalities

# Part 1: Comparing sides and angles

**For each of the triangles below, list the sides from smallest to largest and the angles from smallest to largest in the table provided**

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| --- | --- |
| Sides | Angles |
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|  |  |
| --- | --- |
| Sides | Angles |
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|  |  |
| --- | --- |
| Sides | Angles |
|  |  |
|  |  |
|  |  |

**Use your observations to complete the theorems below**

**Theorem 5-10:** If two sides of a triangle are not congruent,

then the larger angle lies opposite the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ side.

**Theorem 5-11:** If two angles of a triangle are not congruent,

Then the longer side lies opposite the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angle.

# Part 2: Making Triangles

**Use the centimeter grid with a straight edge and a compass to draw the following triangles. If the triangle cannot be drawn, explain why.**

1. **6 cm, 4 cm, 3 cm.**
2. **6 cm, 1 cm, 3 cm.**
3. **6 cm, 2 cm, 4 cm.**

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**Use your observations to complete the theorem below.**

**Theorem 5-12: Triangle Inequality**  
The sum of the lengths of any two sides of a triangle is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ then the length of the third side.