

Triangles to Order

Suppose you have three cards on the form. Those three numbers might be lengths of sides, or measures of angles, or some combination. These are your specifications for a triangle.

- Sometimes, with three cards, you can find a *unique* triangle. That is, you can make a triangle, and there is no other triangle that fits all the specifications on your form.
- Sometimes you can't. Sometimes it's because there is more than one triangle that works with the specs. And sometimes it's impossible: no triangles work.

The Problem

Your job, as a group, is to figure out how to tell whether you can make a unique triangle when you have placed three cards on the form.

What You Do

- Explore! Use the form and turn cards from **Handout #1** face-up. You may use whatever cards you want, but every specification you make must have three cards.
- Divide your poster into two columns. Label them **no triangles** and **triangles**.
 - On the “**no triangles**” side, list specifications where you cannot make any triangles at all.
 - On that same side, list the reasons **why** you can't make triangles with those specifications. If you **generalize** (see below), you can probably put the specifications into groups and explain them all at once.
 - On the “**triangles**” side, list specifications under which you can make triangles.
 - On that same “**triangles**” side, explain **how** you made the triangles, especially if it was difficult. It will help if you can group triangles that “work the same way.”
- Try to **generalize**. For example, there may be several specs where you can't make triangles. Even though the specific numbers are different, the actual reason you can't make a triangle may be the same. Similarly, sometimes the reason you can make a triangle is the same even though the details are different.
- If you come across situations where the triangles are not **unique**, that is, you can make two or more triangles from a spec, give them a special section. Explain them as well as you can. Why can you make more than one triangle in these cases and not in the others?

no triangles	yes! triangles!
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