

# Working with the TI-Nspire to Discover the Triangle Inequality Theorem

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Name \_\_\_\_\_



## Materials:

- TI-Nspire™ or TI-Nspire CAS™
- TriangleInequalityActivity.tns
- TriangleInequalityActivity.pdf
- TI-Nspire™ Software

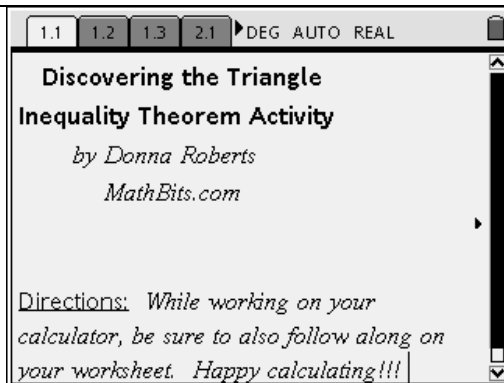
## Classroom setup:

- Can be used with students working alone or in groups of two – one recording and one using the calculator.
- Can be used as a teacher-led demonstration.

## Introduction

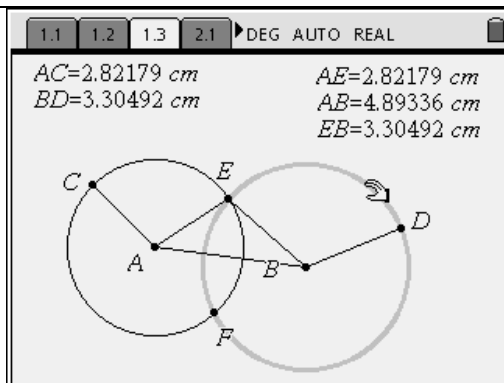
The following activity uses the TI-Nspire as an exploratory tool in the discovery of the Triangle Inequality Theorem. The calculator is going to help you understand the geometric rationale for this theorem by giving you a clear visual representation of what is happening.

As you use your calculator, be sure to fill in the questions on this worksheet.



Use the NavPad to move the pointer near the edge of a circle. When the “hand” appears, grab the circle by “closing the hand” (Ctrl – Center NavPad) and dragging the circle larger or smaller.

Take a few minutes to change the size of the radii of the circles and see what happens to  $\triangle ABE$ .

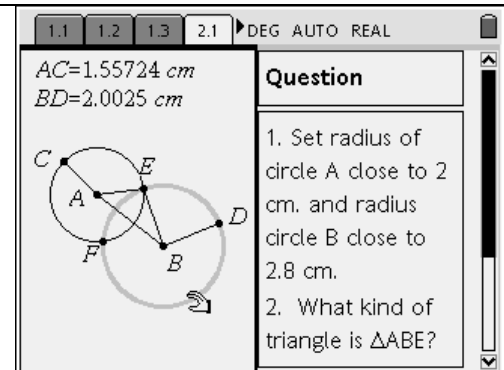


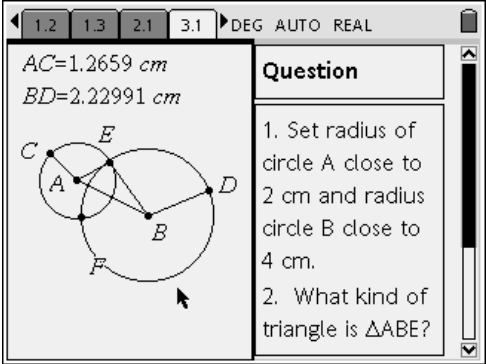
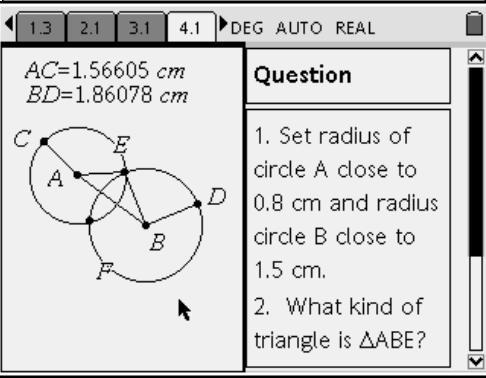
## Task 1:

Set the radius of circle A close to 2 cm.  
Set the radius of circle B close to 2.8 cm.

What kind of triangle is  $\triangle ABE$  ?

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<p><b>Task 2:</b> Set the radius of circle A close to 2 cm. Set the radius of circle B close to 4 cm.</p> <p>What kind of triangle is <math>\triangle ABE</math> ?</p> <hr/>	
<p><b>Task 3:</b> Set the radius of circle A close to 0.8 cm. Set the radius of circle B close to 1.5 cm.</p> <p>What kind of triangle is <math>\triangle ABE</math> ?</p> <hr/>	
<p><b>Task 4:</b> What happened to the lengths of the sides of the triangle when the triangle disappeared?</p>	<p><b>CRITICAL THINKING</b> <i>Discuss in group or with the class:</i></p> <ol style="list-style-type: none"> <li>1. Consider what happened to the lengths of the sides of the triangle when the triangle disappeared.</li> </ol>
<p><b>Task 5:</b> Make an observation about the size of the sides of a triangle in relation to one another.</p>	<ol style="list-style-type: none"> <li>2. Make an observation about the size of the sides of a triangle in relation to one another.</li> <li>3. Investigate to determine what would happen to the triangle if the circles were externally tangent.</li> </ol>
<p><b>Task 6:</b> What would happen to the triangle if the circles were externally tangent?</p>	<p><b>Task 7:</b> Is it possible to have a triangle whose sides are 1, 1, and 2 units?</p>