

## Task

### Law of Sines

In trigonometry you mainly use right triangles to solve problems. Trigonometry can also be used with triangles other than right triangles. For example, if you know the measures of two angles and one side of a triangle (either ASA or SAA), you can find the other two sides with the help of a trigonometric property called the law of sines. The law of sines for acute triangles can be discovered while using trigonometry to find areas of acute triangles. Investigating with Geometer's Sketchpad

- Use the area formula for a triangle.
- In the triangle sketch, calculate the area of the triangle without knowing the height if you use trigonometry. Start by figuring out an expression that gives the height of the triangle in terms of  $\sin A$  and one or more of the side lengths you measured. Write down that expression:  $h = \text{-?-}$
- Now use the calculator to create an expression that gives the area of the triangle. When you think you have the correct calculation, test it by constructing the polygon interior and measuring the area. If the calculation does not match the measurement, analyze what you might have done wrong and try again. When you have it right, write a conjecture stating your formula for the area of a triangle in terms of side lengths and an angle.

### Rubric: Law of Sines

	0	2	4	6
Expression	None	Vague	Sensible	Logical/Complete
Calculations	None	Few	Many	All
Conjecture	None	Sparse	Sensible	Logical/Complete
Final Formula	None	Incorrect/attempted	Partially correct	Correct/Complete