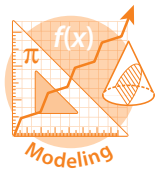
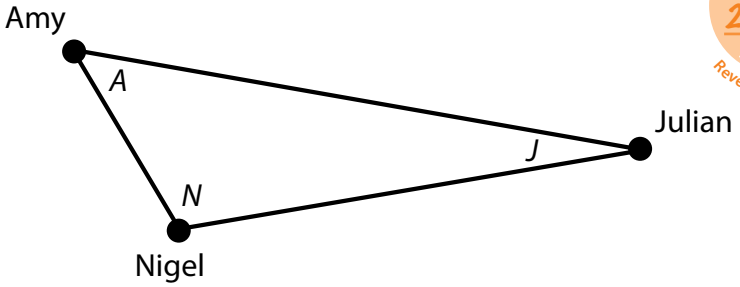
Name: **Date:**

Conceptual Task: Tricky Triangles



SMP	
1 ✓	2
3 ✓	4
5	6 ✓
7	8

A math class is learning about triangles, the law of sines, and the law of cosines. The teacher organizes an activity to assist with their learning. Three students stand at marked points, forming the vertices of a triangle.



Law of Sines: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ Law of Cosines: $c^2 = a^2 + b^2 - 2ab \cos C$

Each student is given partial information about the triangle. Amy knows the distance between Julian and herself. She also knows the distance between Julian and Nigel. Nigel knows the angle between Amy and Julian (N) as well as the distance between Amy and Julian. Julian knows the angle between Nigel and himself (A).

© Walch Education

Name: **Date:**

Conceptual Task: Tricky Triangles

Exploration Questions

a. What information is known about the triangle? Who knows what information? Use the table below to organize the information.

Sides/Angles	Amy knows…	Nigel knows…	Julian knows…
Amy $\rightarrow$ **Julian** $\left(\overline{AJ}\right)$			
Julian $\rightarrow$ **Nigel** $\left(\overline{JN}\right)$			
Nigel $\rightarrow$ **Amy** $\left(\overline{NA}\right)$			
$\angle A$			
$\angle J$			
$\angle N$			

b. What information is unknown about the triangle?

c. Do any of the three students have enough information to calculate an unknown side or angle of the triangle? Explain your answer.

d. If each student is allowed to ask one other student for a single piece of information to help solve the triangle, whom should Amy ask for information? What should Amy ask this person? Why?

e. Whom should Nigel ask for a piece of information? What should Nigel ask this person? Why?

f. All three students are given the distance from Amy to Nigel. Who is likely to use the law of cosines to solve for an unknown measurement after receiving this information? What can they solve for?

g. Who is likely to use the law of sines after the distance between Amy and Nigel is disclosed? What can they solve for?

h. Is anyone still unable to calculate any unknowns after being given this information?

© Walch Education