LAW OF SINES, LAW OF COSINES AND (TAYLOR POLYNOMIALS!)

Student Worksheet **Name: _________________**

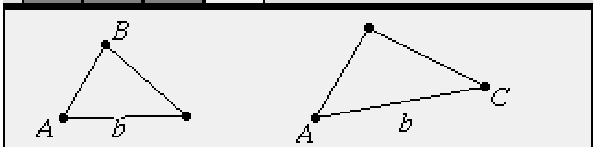
Each page of the activity which requires a written solution is listed below.

1.1 1.2 1.3 1.4 DEG AUTO REAL

LAW OF SINES and LAW OF COSINES (and TAYLOR POLYNOMIALS!)

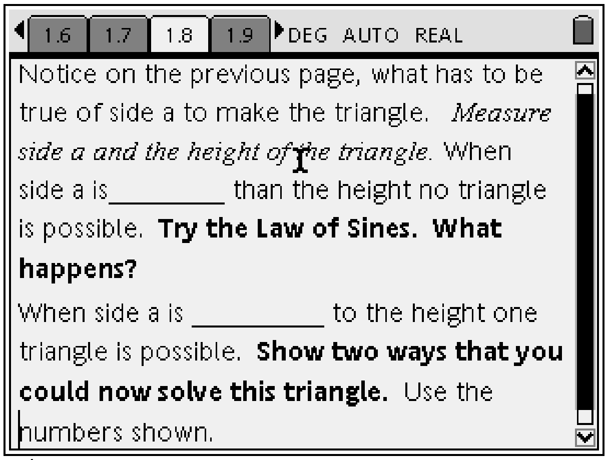
If a triangle doesn't have a right angle, and only some parts of the triangle are known, how might you solve it? These triangles are *oblique*. You need to know the measure of at least one side and any two other parts of the triangle to solve a triangle of this nature. Why?

1.1 1.2 1.3 1.4 DEG AUTO REAL



Give a step by step explanation of how the ratios will help solve the **entire** triangle in the case AAS or ASA as shown above. Assume the labeled parts are given quantities. This is the Law of Sines!

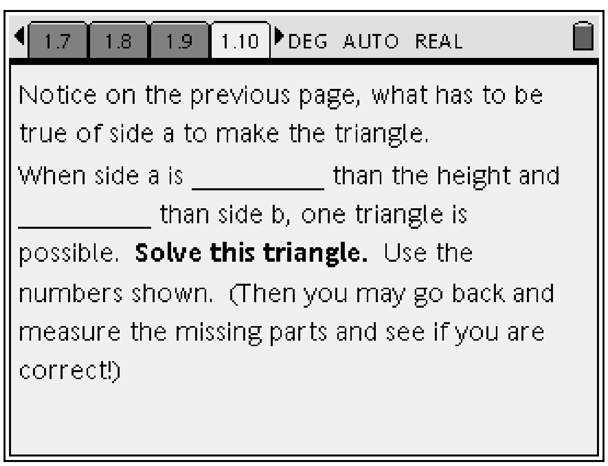
My answers:



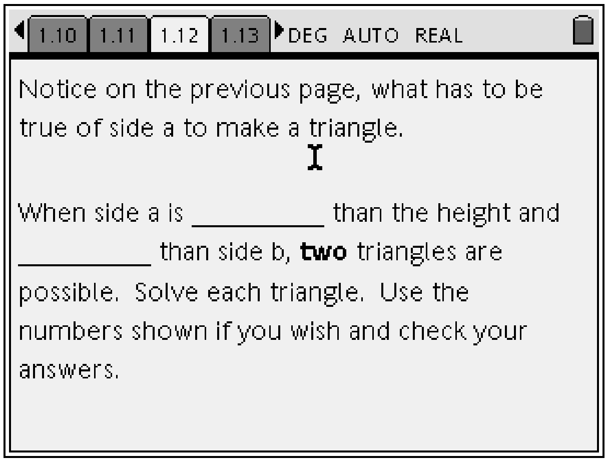
<u>My answers:</u>

1st way (include diagram)

2nd way (include diagram)

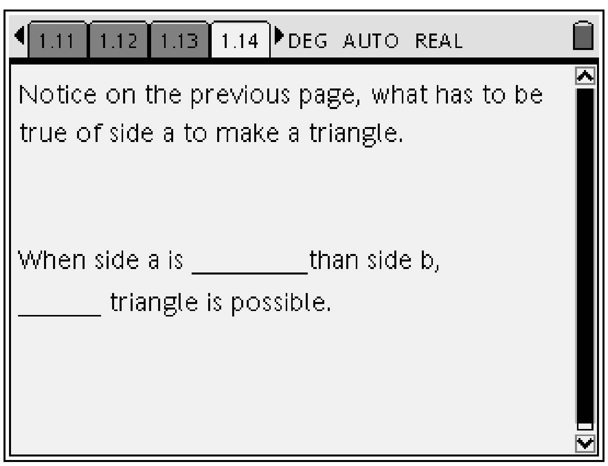


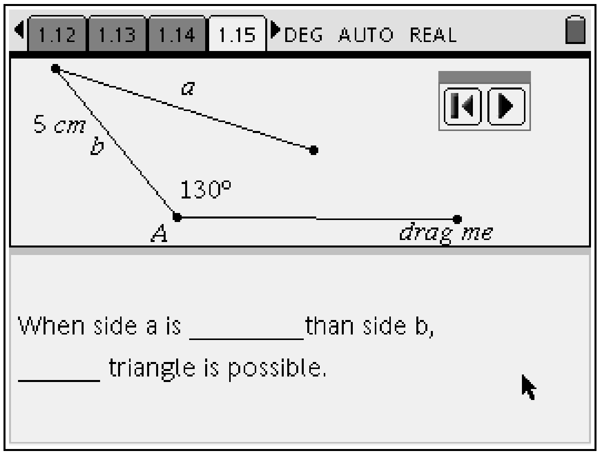
(include diagram)

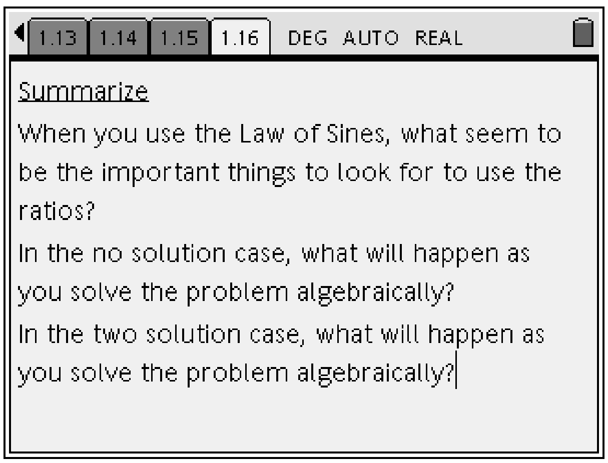


1st triangle (include diagram):

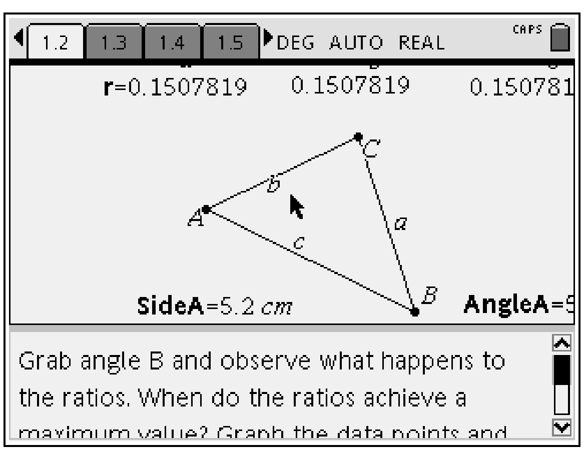
2nd triangle (include diagram):

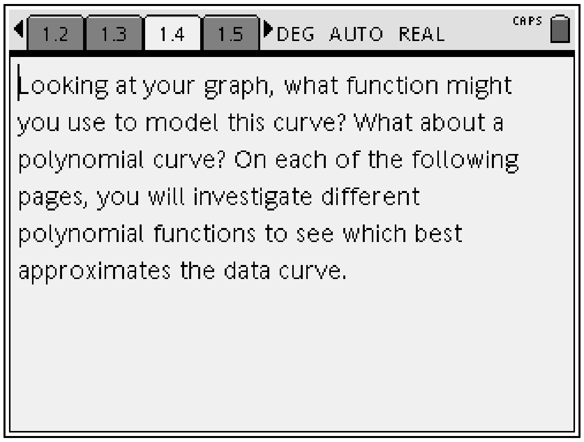


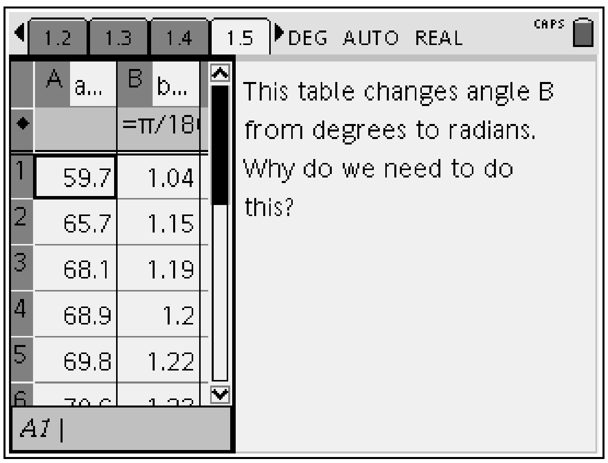


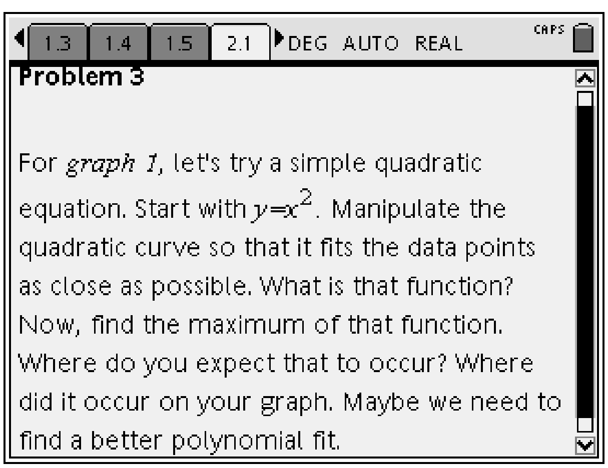


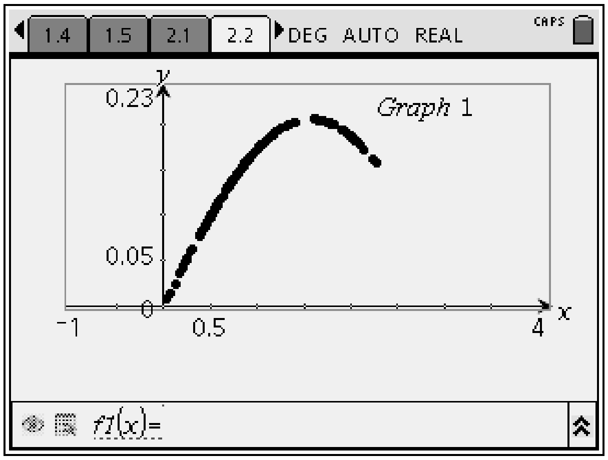
Write complete sentences and give examples if necessary.

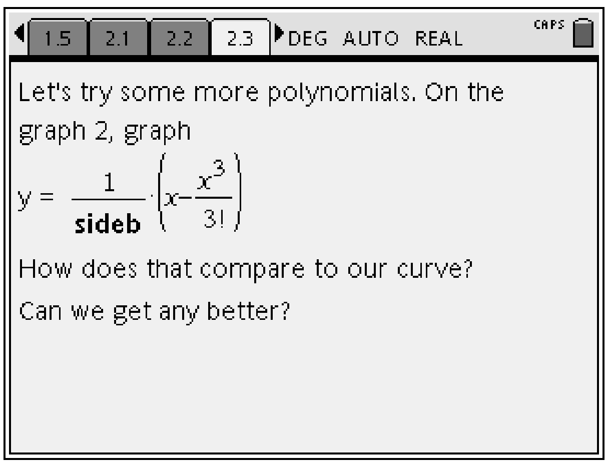


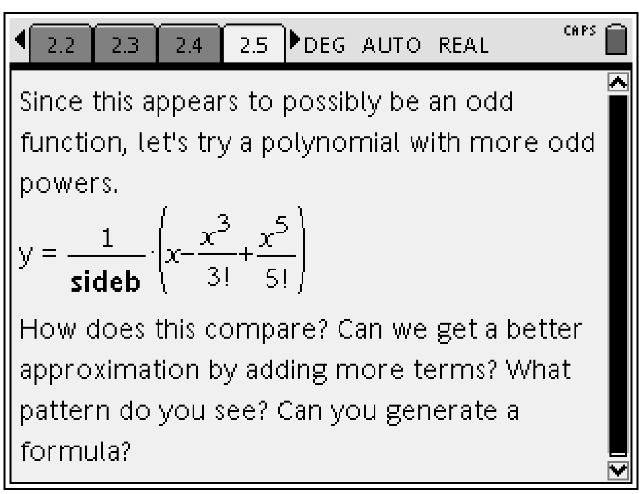

1.2 1.3 1.4 1.5 DEG AUTO REAL
CAPS
Looking at your graph, what function might you use to model this curve? What about a polynomial curve? On each of the following pages, you will investigate different polynomial functions to see which best approximates the data curve.


1.2 1.3 1.4 1.5 DEG AUTO REAL
CAPS
A a...
B b...
=π/18
1 59.7 1.04
2 65.7 1.15
3 68.1 1.19
4 68.9 1.2
5 69.8 1.22
A1 |
This table changes angle B from degrees to radians. Why do we need to do this?


1.3 1.4 1.5 2.1 DEG AUTO REAL
CAPS
Problem 3
For graph 1, let's try a simple quadratic equation. Start with $y=x^2$. Manipulate the quadratic curve so that it fits the data points as close as possible. What is that function? Now, find the maximum of that function. Where do you expect that to occur? Where did it occur on your graph. Maybe we need to find a better polynomial fit.







Record your observations.

2.5 2.6 2.7 2.8 DEG AUTO REAL

We generated our curve using a sine function. And now we can see that we can also get this graph using a polynomial function. Taylor was given credit for writing any function as a polynomial. In your notes, what are the characteristics of trig functions? What are the characteristics of polynomial functions? Why do you think this is a significant connection?

3.1 3.2 3.3 3.4 DEG AUTO REAL

Using your CAS, generate more terms in your polynomial and observe how close the Taylor polynomial gets to the $sin(x)$. What happens as you add more and more terms? What if you added an infinite number of terms?

3.3 3.4 3.5 3.6 DEG AUTO REAL

Let's do some more exploring! Try e^x and use the CAS to generate that Taylor polynomial. What about $cos(x)$? Think of they symmetry of your functions (i.e. even/odd), what is true about the trig function and the powers of the polynomial for each function?