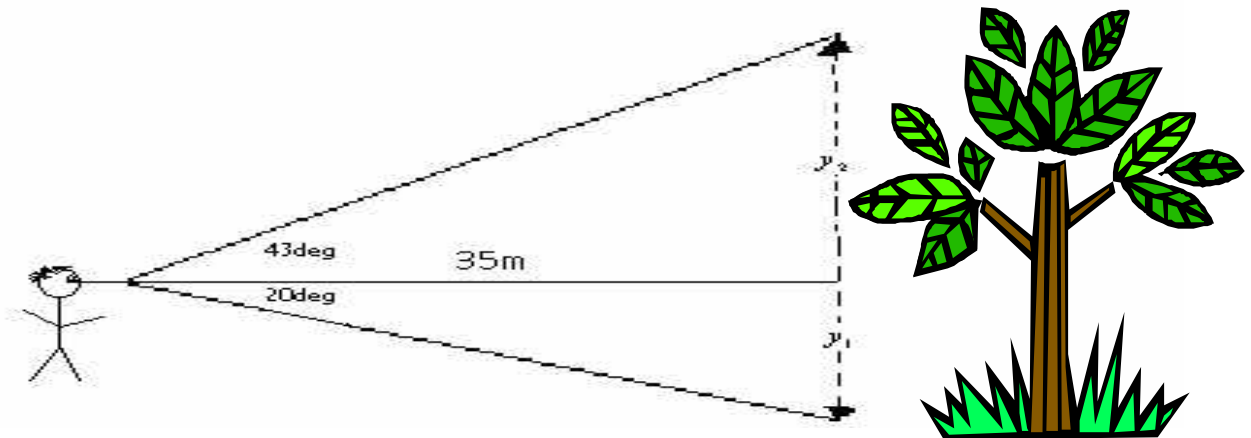


A Fun Trigonometry Lesson by Denise Heffner

As future math teachers my peers and I were offered the opportunity to present in the annual Pennsylvania Council of Teachers of Mathematics convention. In pursuit of more experience in my field I took advantage of the opportunity, and found it not only an impressive addition to my resume, but an occasion when I gained knowledge, experience and erudition.

I presented a trigonometry lesson out of the ordinary curriculum. I put together a number of activities that trigonometry students can perform outside the classroom. My plan was to take the students on a math field trip. Therefore have students not only take measurements outside but also perform the calculations outside the classroom, as opposed to finding the measurements and returning to the classroom to perform the calculations.

The first problem I discussed involved finding the measurements of a tall tree using trigonometric identities. The picture I used looked like:



The students used their knowledge of trigonometry to discover they must use the tangent function to arrive at the height of the tree.

$$y_1 = 35 \tan 20^\circ = 12.74m$$

$$y_2 = 35 \tan 45^\circ = 32.64m$$

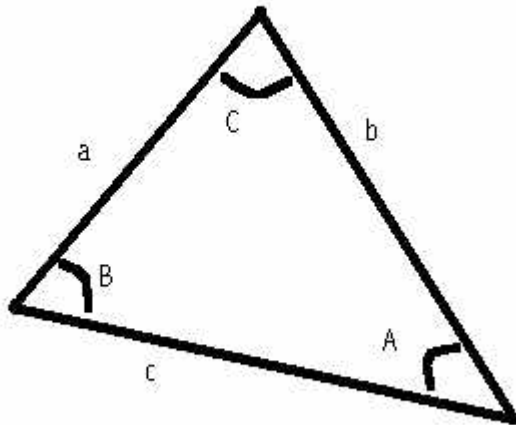
Therefore the height of the tree is:

$$y_1 + y_2 = 12.74 + 32.64 = 45.38m$$

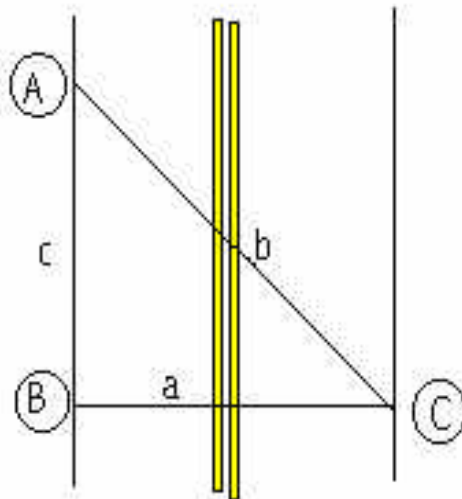
The other two activities I offered implemented two important trigonometric formulas known as the law of sines and the law of cosines.

Law of sines states:

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$



This shows how A, B, and C are angles of a triangle and a, b, and c are the lengths of the opposite sides. The activity in which I used the law of sines involved finding the distance across a road.



Student B and Student C must be directly across the road from each other. Angle ABC is therefore 90° . Then have the students measure from Student A to Student B. Students A and C must find angles BAC and ACB with a protractor. With these measurements the students can use the law of sines to determine the width of the street and also the distance from Student A to Student C.

These activities not only are fun for students, but represented standards set by the National Council of Teachers of Mathematics. Students will learn trigonometry, problem-solving skills, and benefit from working in groups.

I finished with this:

*By using activities like these,
students not only can enjoy
doing math, but see its
relevance in the real world.
And when many
students don't find enjoyment
in simply finding a solution,
like many mathematicians do,
they can see that math can
be fun for everyone.*