When you are done solving a problem do not assume that every student fully understands the solution. Ask the students probing questions to ensure that they have mastered the material. By working many example problems, and by using this lesson as a guide for practice problems, learning Trigonometry will be easier for the student.

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Teacher Resources

Recommended Books

"Trigonometry the Easy Way", by Douglas Downing
"Trigonometry for Dummies", by Mary Sterling
"Trigonometry" by Margaret Lial
"Analytic Trigonometry with Applications" by Raymond Barnett
"Algebra and Trigonometry" by Robert Blitzer

Recommended Trigonometry Web Sites

Online Course in Trigonometry:
http://www.clarku.edu/ ~ djoyce/trig/

S.O.S. Trigonometry
http://www.sosmath.com/trig/trig.html

Topics in Trigonometry
http://www.themathpage.com/atrig/trigonometry.htm

Trigonometry at Wolfram Research
http://mathworld.wolfram.com/Trigonometry.html

Online Trigonometry Tutorial
http://archives.math.utk.edu/topics/trigonometry.html

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LEARNING by Example

THE TRIGONOMETRY TUTOR

User Instructions & Teachers Resource Guide

Grade Level: 9 - College

ACCELERATE YOUR TRIGONOMETRY SKILLS

Introduction

After a student masters Algebra and Geometry the next step in Math is usually Calculus I. There is crucial subject matter that needs to be mastered either in a Trigonometry or Pre-Calculus class prior to entering Calculus I in order for the student to succeed.

Trigonometry can be an intimidating subject because students must learn to be comfortable working with angles. Prior to this point students have only had exposure to angles in a Geometry class. In most cases the student has only been exposed to the degree as a unit of measure for angles and most of their experience base has dealt with how angles relate to triangles.

In Trigonometry students need to master the broader meaning of angles. For example angles greater than 360 degrees must be understood, negative angles must be understood, and the use of the radian as the unit of measure for the angle must be mastered. In addition, students must master how to evaluate the trigonometric functions such as Sin, Cos, and Tan on radian angles without using a calculator. Mastery of this material is crucial to doing well in Calculus, Physics, and beyond.

How to Use This Lesson

In The Classroom

Trigonometry intimidates many students. For this reason, when using this lesson in the classroom, the following techniques may be useful.

After a problem is presented but before the solution begins, pause the program and make sure that each and every student completely understands what information is given in the problem and what needs to be solved for.

After the problem has been solved in the lesson, pause the program and make sure that every student understands every step in the solution.

In some cases it is helpful after a student watches the solution to a problem to pause the program, present the very same problem on the chalkboard, and ask the class to solve it again. Even though it is the very same problem, this process reinforces the steps needed to reach the solution and, more importantly, gives the student confidence.

At Home - Self-Study

When using this lesson at home for self study, the following tips are useful.

Rewind the program at any time if you do not understand something. It is very important that students understand every single step in the solution in order to gain confidence and understanding of the solution process.

The problems are specifically chosen so that the earlier problems are less difficult than the later problems. For this reason, if a student doesn't understand the solution to problem 1 of the lesson and goes on to problem 2 or problem 3, it will lead to a lack of understanding. Continue repeating a problem solution until it is fully understood prior to continuing on.

Homework Strategy

The method of teaching employed in this lesson is to introduce the concepts by working example problems. This gives the student confidence and the skills to do well on homework and exams.

The best way to master the material and prepare for exams is to work many, many problems and ensure the correct answers are reached every step of the way. It is very beneficial to work the odd numbered problems in the back of the student's textbook and check answers for each problem. Start with the easier problems and work your way to the harder problems.

After homework has been assigned it is useful to have some of your students work the problems out on the board for the benefit of the other students. This allows the student to explain his or her thought process. Sometimes hearing another student's solution will allow other students to "get it".

Test Taking Tips

The following test taking tips are very useful in Trigonometry:

a) Write down what information is given in the problem.
b) Write down what is asked to be solved for (the unknown).
c) Write down any relevant equations to the problem at hand.
d) Try to devise a strategy in order to solve the problem.
e) Using the equations and your strategy, begin to solve for the unknowns in a step-by-step fashion.

Checking Your Work

In many cases it is easy to check your solution and not let errors creep into the final solution. The best way to do this is to simply do the calculations a second time and verify the math. Another method is to take the answer and plug it back into the relevant equations to verify that the solution is correct.

Final thoughts

Trigonometry is taught best by working example problems. It will be necessary to give a short lecture at the beginning of the day to explain the concepts, but it is in many cases very helpful to immediately supplement the lecture with worked example problems. When doing this use the methods employed on this lesson. Specifically, state the problem clearly and make sure that every student understands it, form a plan to solve the problem, and work each solution in a step-by-step manner.