



GTEAMS at Flowing Wells High School

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Teaching Objectives

To many of the seniors of Flowing Wells High School, Pre-Calculus is their last endeavor in mathematics before graduation. Whether it shows through, or is disguised by claims of "Senioritis", each and every student in the classroom has an eagerness to learn. Our mission as teachers is not only to convince ourselves of this, but to convince them as well. Sometimes it takes a little persistence, but every "Aha!" and "Oh, I get it!" is a sign that we are on the right track.

Projects

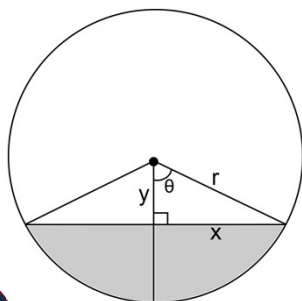
One way of showing students that mathematics is relevant in the world outside the classroom is through hands on projects. When mathematical concepts are rooted in a physical setting, abstract ideas become tangible.

The Tale of a Truck: "I Wish I Paid Attention in Trigonometry"



Click and Clack from the NPR show "Car Talk" take a question on air that has a clever solution through Trigonometry.

A truck has a fuel tank which is a 20 inch diameter cylinder resting on its rounded side. The driver notices that his fuel gauge is no longer giving the correct readings, so he has to improvise. He places a measuring stick from the top of the tank, through the center of the cylinder and down to the bottom. He pulls the measuring stick out and finds that the height of the fuel is 6 inches. What fraction of a full tank is left?



Smile, you're in Mr. Taylor's class!!



About Us

Mr. Leach

Is currently pursuing a Ph.D. in Applied Mathematics, his research focuses on developing computational techniques in probability.

Mr. Taylor

Is a proud Virginia Tech. alumnus, Air Force veteran, and Flowing Wells High School Mathematics teacher.

The Period of a Pendulum: "On Earth, Or On the Moon"



$$T(l) = 2\pi \sqrt{\frac{l}{g}}$$

Using period as a function of length, students were able to calculate the period of the pendulum in "Big Ben". By changing the parameters in the problem, the students determined what the period would be if a pendulum was sent to the moon. The function also provided an example of a square root scaling in physics.

The students used their knowledge of inverse functions to write length as a function of the period of a pendulum. By setting the period to be one second, the students were able to find the length necessary for the pendulum to function as a clock. Using a weighted string and a stopwatch, they were able to verify their calculations.

The Classroom

Every day, students start their bellwork as soon as they enter the classroom. The problems are either review of previous material or a primer for the days class. This keeps the students focused and gets their brains warmed up!

BELLWORK

Find the real number x in the interval $[0, \pi]$ that has the same cosine value as the given value.

1. $\cos(3\pi)$

2. $\cos(-\frac{\pi}{4})$

Find the real number x in the interval $(-\frac{\pi}{2}, \frac{\pi}{2})$ that has the same tangent value as the given value.

3. $\tan(4\pi)$

4. $\tan(\frac{3\pi}{4})$

We don't simply teach the students how to solve a problem, we show them the logical process that we go through ourselves.

The students have the opportunity to test their own understanding through UDo problems. They often include a twist that forces them to think critically.

Evaluate $\sin(\arccos \frac{\sqrt{5}}{5})$ UDo

Write an algebraic expression that is equivalent to $\sin(\arctan(3x))$

Student:
When are we ever going to use this?

Mr. Leach:
Maybe you won't ever use it, but you aren't here just to memorize new material. You are here to develop better logic and reasoning skills. They are a part of mathematics, and they are something that I'm sure you'll be using all of the time.

Student Work

