

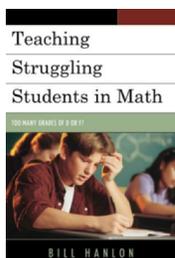
## Nevada Public Education



### *Algebra II for All Students End-Of-Course Exams for Graduation ~ Foolishness ~*

*Bill Hanlon*

Dear legislator:



Making Algebra II and EOC Exams Mandatory for graduation – *not that smart.*

Please send notification to the State Board of Education and Department of Education indicating:

- \* Algebra II should not be required for high school graduation.
- \* The end-of-course exams in algebra and geometry used for graduation should be discontinued.

The *one-size-fits-all* common core standards in math require all students to take Algebra II. This push was made by the National Governor’s Association with their partners in Achieve and the Council of Chief State School Officers (CCSSO). These are connected organizations who, through the use of “groupthink”, came up with the *solution* to the nation’s public education problems. Yeah, right.

Two years ago, the people behind the common core finally admitted what secondary math teachers already knew. There were problems with the standards. Their explanation for their screw-ups, *they were rushed*. The Conflicted NV State Board of Education has steadfastly refused to address issues with the standards they adopted and the tests needed for graduation. Not only are there issues within the standards and assessments, the *one-size-fits-all* component is troublesome on its own.

First of all, just where does *one-size-fits-all* work in any sector of the world? It doesn’t. And it doesn’t work in math either.

In order to achieve the goal of *all* students taking Algebra II, students lose access to vocational courses, the ability to leave high school with saleable skills or a developed interest in a career. Having all students enrolled in Algebra II means the entire spectrum of students, special education to honors, are in the same class. Think about that for at least two seconds.

Having 40 plus students in an algebra class is problematic, then adding the disparity between the students is a sure recipe for disaster. There are students who want to be there because they may have already decided to go into a field that requires knowledge and understanding of math or considering a field where higher level math has some importance. Other students may just want a career that doesn't entail a lot of math, there are the students who haven't acquired the knowledge and skills needed to be successful in Algebra II, and there are students who just don't have an interest in math. Imagine that.

Of course, in addition to these standards, you have the same Governors pushing increased graduation rates – which translates to *failing* students must be passed.

As a math person, I would like more students to not only enroll in math, but enjoy learning it, see the beauty behind it and how it all fits together, see how it's applied, and go into scientific fields knowing the importance of math.

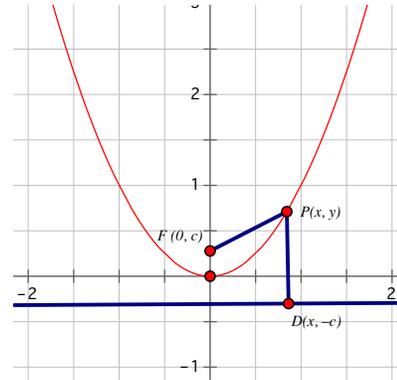
The following is an example of what all students are expected to be able to do upon graduation – an Algebra II standard. All students taking Algebra II are required to be able to derive formulas like the parabola. In order to better understand math and apply math, concepts like these need to be developed. I chose deriving the formula of a parabola because it has very few steps, is easy and straight-forward – derivations don't get easier than this.

A **parabola** is a set of points, ***P***, in a plane whose distance from a fixed point, ***F***, called the *focus*, is equal to the perpendicular distance from ***P*** to a line, called the *directrix*.

Since this curve is being defined by distances – we need to know the distance formula.

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

By the definition of a parabola, we know  $FP = PD$  for any point  $P$ . Substituting those coordinates into the distance formula, we have



$$FP = PD$$

$$\sqrt{(x-0)^2 + (y-c)^2} = \sqrt{(x-x)^2 + (y-(-c))^2}$$

Squaring,  $x^2 + (y-c)^2 = 0^2 + (y+c)^2$

Expanding  $x^2 + y^2 - 2yc + c^2 = y^2 + 2yc + c^2$

Subtracting  $c^2$  &  $y^2$   $x^2 - 2yc = 2yc$

$$x^2 = 4yc$$

This is an equation of a parabola with vertex at the origin and  $c$  being the distance between the Focus,  $F(0, c)$ , and the vertex and the vertex and the directrix;  $y = -c$ . Once the students learned that, they would have the opportunity to find equations that were translated in the rectangular coordinate system.

Deriving that equation is an expectation of **all** students.

After deriving the equation, students should be able to solve and graph quadratic equations by knowing zeros, vertex, focus, and directrix and be able to solve problems, especially max/min problems. In addition, students would be expected to know properties of parabolas. That is how they direct light and sound waves and how that information is used in satellite dishes, flashlights, acoustics, etc. and be able to solve problems.

Here are two main issues; 1. Some students just don't have an interest in learning more abstract mathematics. That should be okay. I have never asked my plumber, car technician, electrician how they performed in Algebra II before allowing them to work, and 2. There is a shortage of math teachers in the nation, the states have not guaranteed all students to have qualified teachers. Until that happens, why would we push students into bad experiences so they end up hating math.

Legislators need to direct the reluctant and Conflicted NV State Board of Education to review their standards and abolish the end-of-course exams required for graduation that certainly fail the transparency test – “*playing gotcha*”. As previously mentioned, there are issues in the standards now recognized nationally – except in NV. The geometry standards are a mess and certainly not in alignment with national exams such as the college entrance exams like the ACT or SAT. There is not one question on either of those exams multiple practice tests that require students to know Transformational Geometry. Why then are we pushing it when other states and national exams are diminishing its importance?

The solutions in Nevada don’t work simply because they are more about politics and bragging rights – *see what I have done mentality*– and not about the work that occurs in the classrooms. It’s the teachers that make the difference!

The policies, regulations and practices put into place in the last decade have changed the achievement trajectory of the state. *Ten years ago, Clark County was recognized nationally as the fastest improving district in the nation, under the current leadership and outside interference, the state is ranked dead last in the nation.*

The Legislature must direct the State Board of Education to drop the Algebra II requirement for graduation so students have more opportunities to enroll in vocational programs. The Legislature must also amend the law requiring end-of-course testing for graduation in algebra and geometry until they are aligned with the ACT/SAT and there is the same transparency that is demonstrated on tests such as the AP, ACT, SAT, LSAT, GMAT, civil service testing and state driving license testing that publish practice tests and questions to better prepare students. The “*gotcha*” mentality at the state doesn’t serve our students well.

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