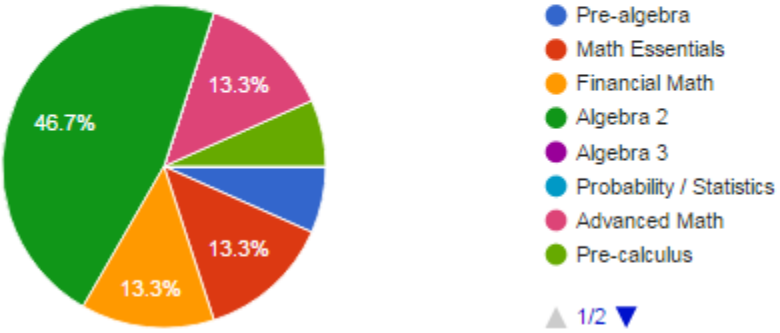
Are We Teaching the Right Math in the Right Way?

Non-EOC Math Courses Email PD Session 1a – Teacher Responses

Choose one non-EOC high school math course you teach that you would like to discuss in this forum.

(15 responses)



Unpacking the Standards

What is a topic you will teach at some point over the next few months with which students tend to have greater than normal struggles.

(15 responses)

- Analysis of Higher Order Polynomial Functions
- factoring
- calculator skills: using a graphing calculator
- Connecting real data to an equation or visa versa writing an equation from real data
- Interest or Tax, anything involving percents
- Solving Radical equations
- polynomial
- Completing the Square
- Factoring Quadratic Expressions and Equations
- logarithmns
- trig identities
- Conic Sections
- Rational Exponents
- Proving Equations True using Trig Identities
- slope of a line

List the standard(s) most closely related to the topic described in the previous question.

(15 responses)

Arithmetic with Polynomials and Rational Expressions (A-APR) Understand the relationship between zeros and factors of polynomials (2, 3) Use polynomial identities to solve problems (4)
A2: A-REI B4b
8.EE.1,3,4,5,6; 8.F.2,3,4
functions and modeling
Multiply and divide positive fractions and decimals N-5-M
A.REI.1 and A.REI.2
like terms
HSA-REI.B.4 Solve quadratic equations in one variable.
CCSS.MATH.CONTENT.HSF.IF.C.8.A Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
CC.9-12.F.BF.5
rewriting expressions in equivalent forms
F.IF-4; F.IF-7; F.IF-8; A.SSE.3
CCSS.Math.Content.HSN-RN.A.1, CCSS.Math.content.HSN-RN.A.2
F-TF.8, 9
F.IF.6 , Mathematical Practice 2

Explain why you believe students struggle with this topic. (15 responses)

There is not a solid foundation in factoring and solving higher degree equations.

because they do not know their multiplication tables and rules for factors& multiples

many sped students just are overwhelmed with the idea of a graphing calculator

The very basic concept of input / output is not understood by many students

If the calculator won't change percent to decimal with one touch of a button then students don't take the time to change or they forget to change

Students may not know their multiplication facts. Students have a tendency to think the exponent is what the base is multiplied by. This would lead them to not be able to reverse the process with radicals.

inability to recognize similar terms

I believe students struggle with this topic because there are several steps that they must remember.

I believe students struggle with basic number concepts like multiplication rules and factors.

Difference between exponent and base, factoring issues

logical thinking skills

Weakness in factoring, completing the square, graphing

Students generally don't like fractions, or understand them. When they see fractions as an exponent, they don't even want to try to learn it!

It requires more than a simple following of algorithms. Students have to genuinely understand the concept behind the trig identities to be able to use them to prove equations true.

They have difficulty associating slope as a rate of change or how things change and they also struggle with operations involving integers.

Describe an ineffective teaching strategy often used by teachers to address this topic.

(15 responses)

- memorize
- memorize
- Lecture
- inverse of multiplying, undoing the foil method
- hand out the calculators and never practice the keystrokes and functions
- Teaching a method instead of teaching why?
- Move decimal 2 places to the left. Small percents especially when the number isn't whole can give students problems. 5.25% may not be changed correctly or at all because .0525 doesn't look correct to a student.
- To start out showing the radical and how to reverse the process before they have even reviewed the squares or cubes. Or the rules of exponents.
- Not identifying each term so that students can catch on
- I have never taught this topic before. This is my first year teaching Algebra II.
- Teachers often used the FOIL method to teach kids how to multiply binomials. This method skips over an important concept used when factoring quadratics.
- Traditional lecture/textbook examples only
- Simply giving students the rules to follow
- Memorization.
- Just presenting the slope formula and letting kids plug in numbers to it.

Describe an effective teaching strategy to address the topic. (15 responses)

you tell me

you tell me

team work and technology

algebra tiles, upside down method

put up the sped calcs. experience the graphing calcs for computation and show some basic functions from our course so far: absolute value, squaring, cubing, sq root and any root ... use the MATH key and it's four categories

Giving students examples of real data where something is changed based on an action or "rule", then have students give some examples. Then try and connect the concept to functions written as algebraic expressions.

Divide all percent by 100 before working the problem.

I plan to have students review the exponent rules because we covered this in multiplying and dividing with exponents. The students created a foldable with the rules they will then create a flow chart using these rules when breaking the exponents down under the radical sign.

Identifying each term by underlining those that are alike as you solve the problem

I have spoken with a teacher who had a song to help students remember the steps.

I reteach multiplying binomials using the double distributing property. I do not let my students use the FOIL method. I make them show their work. Once I feel that they are comfortable with that process, we move on to factoring. I teach it like it's just multiplication in reverse.

Use of technology, graphing calculators for exploration/discovery activities, interactive group work where students can talk out /demonstrate variety of approaches to solutions, creative graphic design project to demonstrate understanding of all conics

First, I try not to use variables when introducing the subject. Students get more confused with variables so I try to use numbers they recognize from our earlier unit on radicals. We've already discussed simplifying perfect squares and cubes so I use more recognizable numbers first. I try to use a discovery method when I introduce it by placing some problems with answers on the board and having them generalize to form a rule. I usually have to guide them through this process.

Put everything in terms of sine and cosine.

I will let my students measure the rise and run of a book , ramp or staircase or pictures of road signs with slope so that they can visualize the concept of slope.

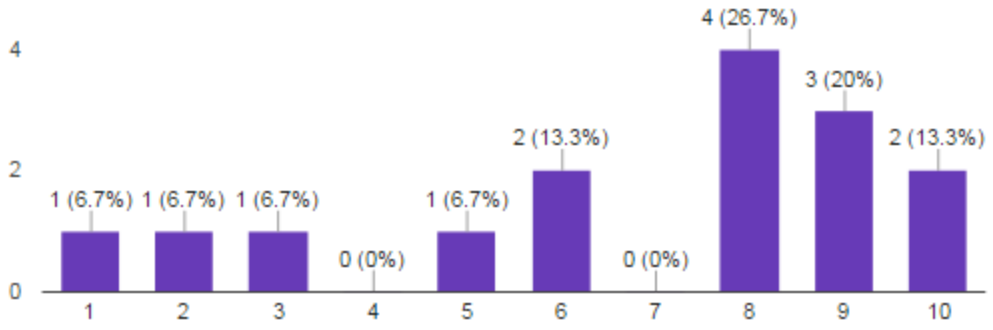
Additional Feedback

Please provide any other comments you have related to the standard(s) addressed in this Google Form.

(8 responses)

In reviewing the 8th grade and Alg 1 standards, I don't see any that specifically relate to using the graphing calculators; however, at some point instruction on the calculator is a must. We have covered the standards listed without using calculators. Now in preparation for semester test, we are reviewing with the calculators and teaching keystrokes.
Adding interest back to problem and repeating the steps can be confusing to students also.
I would like to know more about connecting this unit to the real world with real world activities.
none at this time
Factoring is an essential tool students need to move forward in high school math. We need it for the zero product rule and finding x-intercepts of parabolas.
I look forward to hearing other methods of teaching this topic.
It can be a fun topic if the teacher takes the time to make it fun.
n/a

On the scale below, rate this professional development process? (15 responses)



Thank you for completing this task! You may use the space below to comment on your scale response in the prior question...

(6 responses)

I enjoy reflection on my planning and accountability. However, there is a definite gap between accountability and expectations. Example: in my situation, I am team teaching. I have a person with me each day, each class; however, we are not team teaching. I do it all. So, is my partner receiving the same pay, perks, etc ... but NOT having to do the tasks I complete? It seems that way. Then my evaluation ... the lowest score I have ever received. And the form is not factual: the bell ringer was completed and over before the evaluator arrived. The class activity to relate the bell ringer and our content was in progress and this was the exit ticket for that period. It covered about 15 min, but the evaluator took this as an overdrawn bell ringer ... I teach difficult students, willingly. And have come a LONG way with my group. I feel like my legs were kicked out from under me after receiving my evaluation. However, I will comply with teaching requirements.

I'm not sure where it is going yet, is the reason for my answer.

this does not provide any information for me. Waste of time unless you plan to have in person share sessions to discuss how best to present the topic

I'm not sure how this is (in/of itself) professional development for me, perhaps it will be used to develop professional development activities/presentations/etc.

I'm not sure how much I like it yet. I don't know the format that I will be able to see others' responses. I look forward to trying something new!

I like the use of Google forms to fill out the information. A list of the standards to choose from could help improve the form, along with sample answers to the open-ended questions.