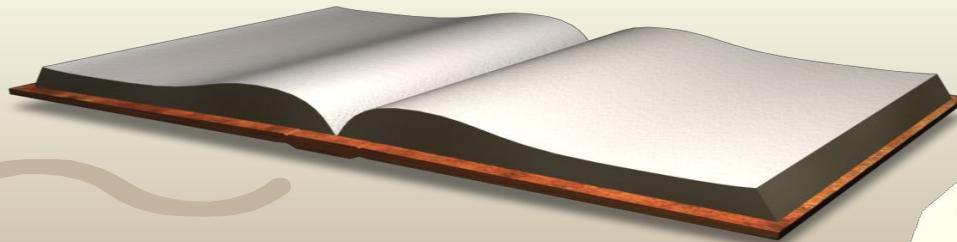


# Curriculum Night Honors Trigonometry/Pre-Calculus and College Algebra/Trigonometry

Curriculum Fair: February 17, 2023

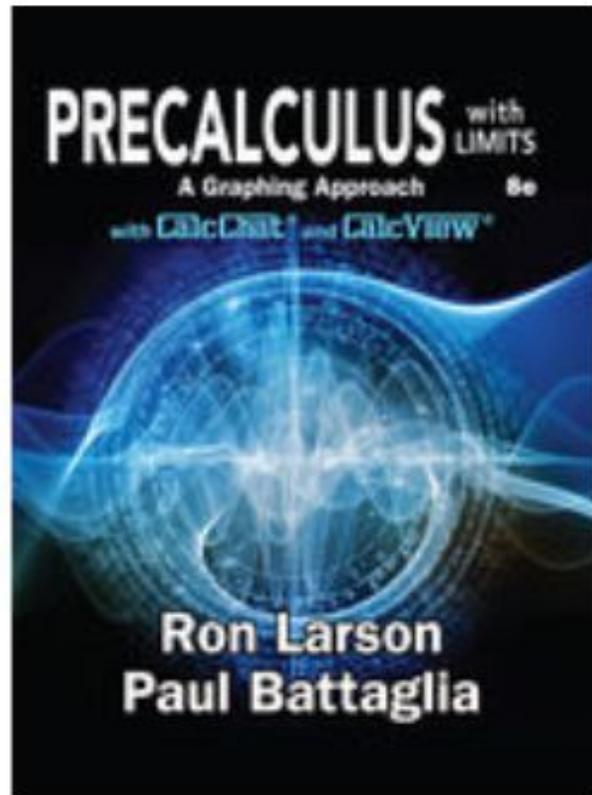
Mr. Fochtman and Ms. Vecchio



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# Honors Trigonometry/Pre-Calculus

001



**Precalculus with Limits: A Graphing Approach, 8th, Student Edition**

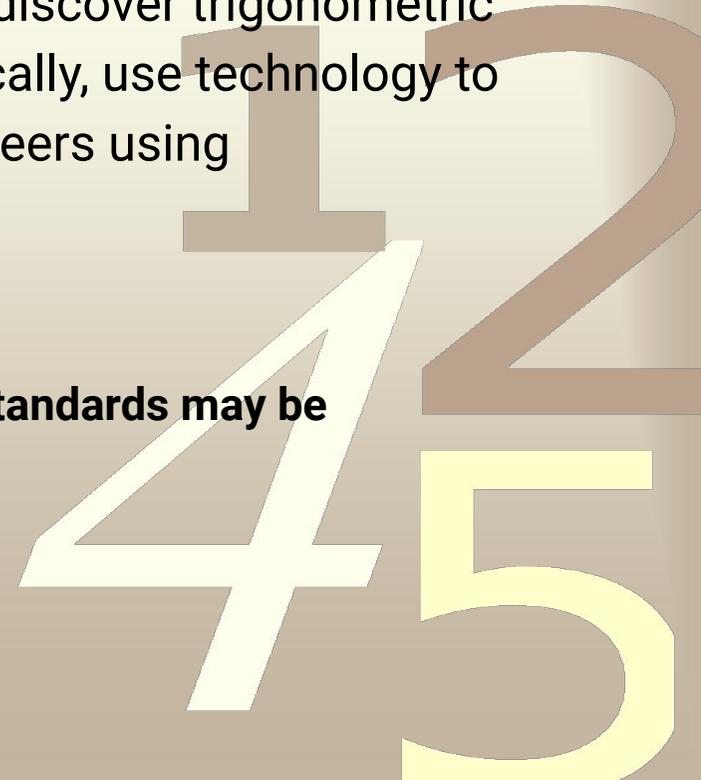
# Honors Trigonometry/Pre-Calculus

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\*\*\* Honors Trigonometry and Precalculus is designed to broaden and strengthen fundamental concepts from geometry and algebra and gradually transition to an understanding of calculus and trigonometry. Together, we will discover trigonometric and periodic functions, solve equations analytically and graphically, use technology to solve trigonometric equations, present solutions and ideas to peers using mathematical models, and introduce concepts of calculus.

\*\*\* The Pennsylvania Curriculum Framework and PA Common Core Standards may be referenced at the following website:

<https://pdesas.org/CMap/Cframework/>



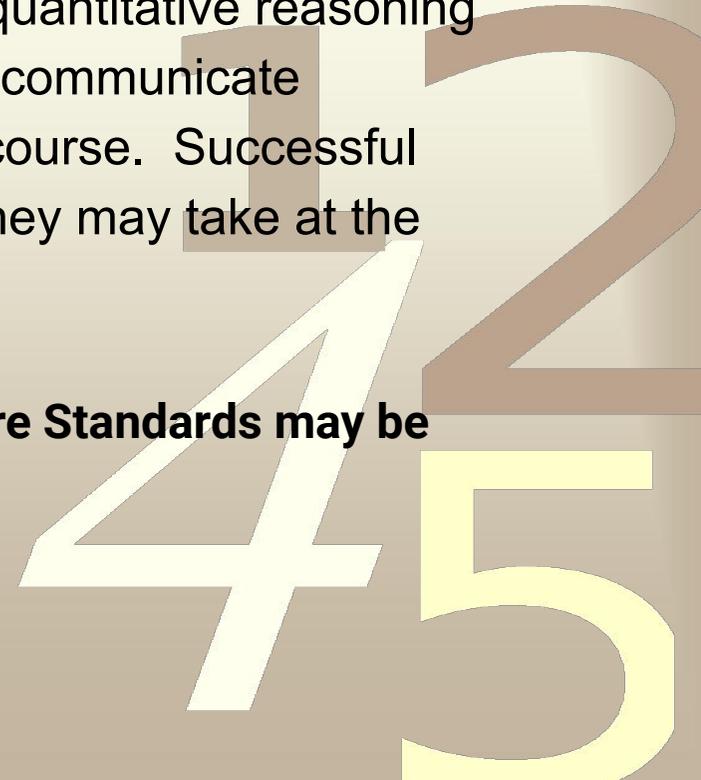
# College Algebra/Trig

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\*\*\* College Algebra/Trigonometry will allow students to build a strong foundation of concepts, techniques, and applications that will prepare them for future careers and more advanced coursework simultaneously. Development of quantitative reasoning and problem-solving skills, as well as ability to understand and communicate mathematical ideas effectively will be stressed throughout the course. Successful completion of the course prepares students for math courses they may take at the collegiate level. The use of a graphing calculator is required.

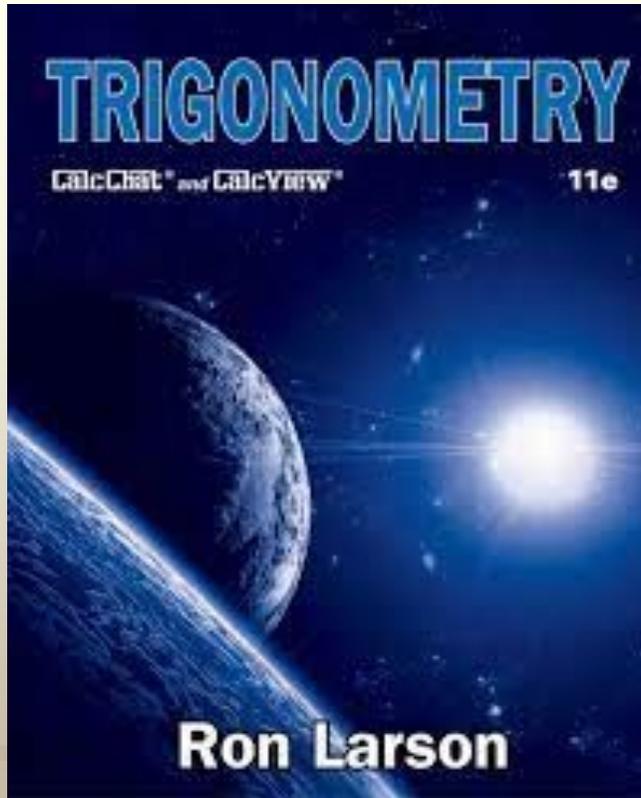
\*\*\* The Pennsylvania Curriculum Framework and PA Common Core Standards may be referenced at the following website:

<https://pdesas.org/CMap/Cframework/>



# College Algebra and Trigonometry

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Trigonometry, 11th

Edition

1 2  
4 5

# WHY TRIGONOMETRY??

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- The topics that are covered in trigonometry **encourage students to use problem solving and prepare them for future pursuits that may include careers in STEM (science/technology/engineering/math).**
- Trigonometry is widely used in the **medical field, astronomy, navigation, and throughout the military.**
- Trigonometry serves as a bridge between Algebra 2 and upper level math courses to prepare students for careers in **medicine, engineering, nursing, business, computer science, and so many more!!**

# WHY PRE-CALCULUS??

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- Designed to be taken after Algebra II, pre-calculus **builds upon knowledge and understanding of various aspects of functions** and expands their knowledge of trigonometric functions, all while helping students make connections between geometry and algebra.
- Trigonometry is widely used in the **medical field, astronomy, navigation, and throughout the military.**
- Trigonometry serves as a bridge between Algebra 2 and upper level math courses to prepare students for careers in **medicine, engineering, nursing, business, computer science, and so many more!!**

# WHY PRE-CALCULUS??

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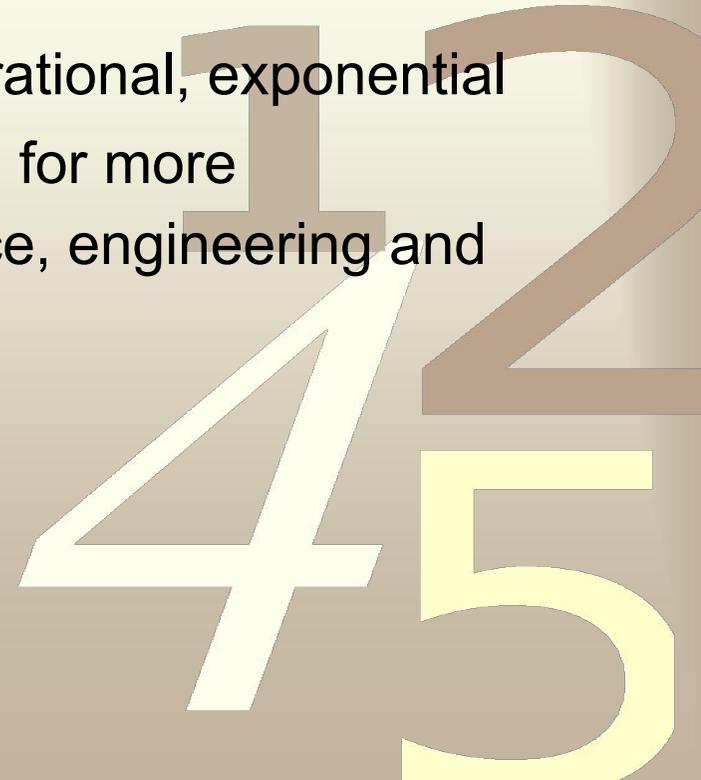
- **80% of College Majors require students to take at least a semester of Calculus**
- Trigonometry and Pre-Calculus truly offers us a chance to see mathematics start to “come alive” within real world contexts



# WHY COLLEGE ALGEBRA/TRIG?

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- This 12th grade course consists of the introduction of Pre-Calculus and a study of right triangle trigonometry.
- The course examines higher degree polynomials, rational, exponential and logarithmic functions and trigonometry needed for more specialized study in mathematics, computer science, engineering and other related fields.



# WHY COLLEGE ALGEBRA/TRIG?

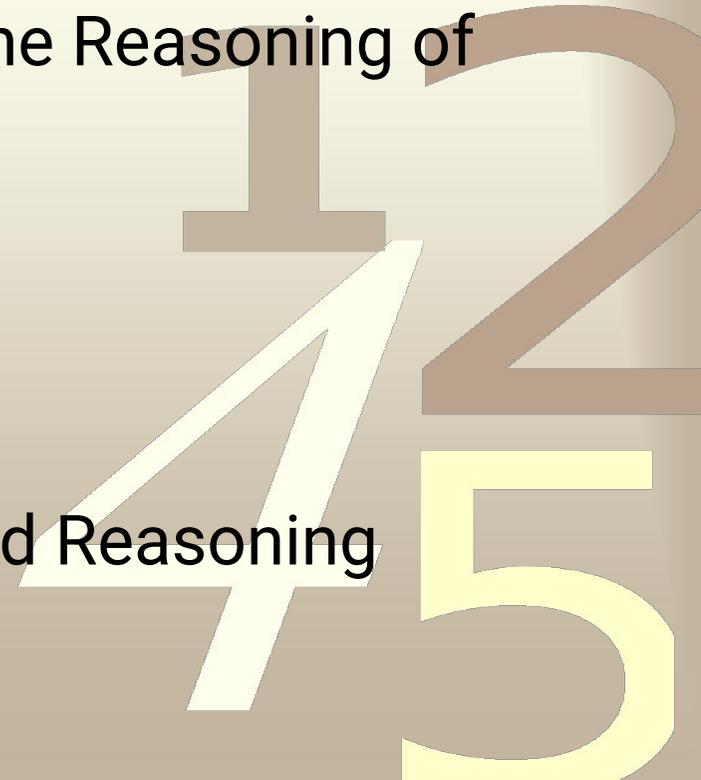
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- Designed to be taken after Algebra II, College Algebra/Trig allows students to build a strong foundation of concepts, techniques, and applications that will prepare them for future careers and more advanced coursework simultaneously.
- College Algebra is widely used in the **medical field, business, finance, and a variety of postsecondary careers.**
- College Algebra serves as a bridge between Algebra 2 and upper level math courses such as Statistics and Calculus.

# UPPER LEVEL MATH PRACTICES

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1. Make Sense of Problems and Persevere in Solving Them
2. Reason Abstractly and Quantitatively
3. Construct Viable Arguments and Critique the Reasoning of Others
4. Model with Mathematics
5. Use Appropriate Tools Strategically
6. Attend to Precision
7. Look for and make use of Structure
8. Look for and Express Regularity in Repeated Reasoning



# Examples of Trig/Pre-Calc in Real Life

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- **Catching a cold/COVID**

- ❖ Medical fields use calculus to determine the rate of a disease outbreak and its ability to metastasize.
- ❖ The logistical growth equation is used to measure the spread of the disease.

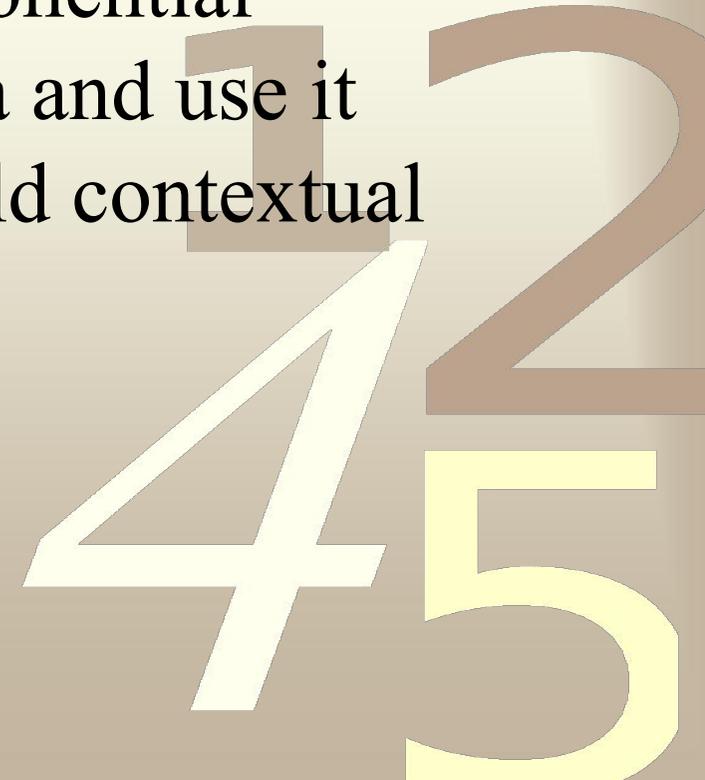
- **Satellite Radio and Phone Signals**

- ❖ We would not be able to effectively use our cell phones or GPS (THE HORROR) without an understanding of sine and cosine functions

# Impacts of Trig/Pre-Calc in History

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- Challenger Space Shuttle Tragedy
  - ❖ Explained and examined using exponential equations; we learn to interpret data and use it when making decisions in real-world contextual situations.



# Examples of College Algebra in Real Life

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- **Compound Interest**

- ❖ Students learn to use compound interest formulas to make decisions about investment opportunities.
- ❖ Students utilize compound interest to make decisions about future retirement options.

- **Satellite Radio and Phone Signals**

- ❖ We would not be able to effectively use our cell phones or GPS (THE HORROR) without an understanding of sine and cosine functions

# Honors Trig/Pre-Calc Curriculum

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- Trig Functions
  - Right Triangle Trigonometry
  - Graphs of Sine and Cosine
- Analytic Trigonometry
  - Verify Trig Identities
  - Sum and Difference Formulas
  - Double and Half Angles



# Honors Trig/Pre-Calc Curriculum

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- Additional Trig Topics
  - Law of Sines/Cosines
  - Polar Coordinates and Polar Graphing
- Pre-calculus
  - Functions and Graphs
  - Polynomial and Rational Functions
  - Exponential and Logarithmic Functions
  - Conic Sections
  - Introduction to Calculus; Limits and Continuity



# STUDENT WORK



0011



Mr. Rich Fochtman @MrFochtman206 · 3m

More projects



# STUDENT WORK

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**Mr. Rich Fochtman** @MrFochtman206 · 5m

Sine and Cosine graphing project day in Honors Trig. Great job everyone!



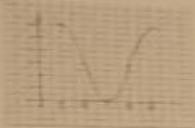
# STUDENT WORK

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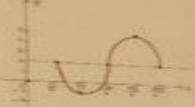
Cosine Graph

$$y = 3\cos(2x - \pi) + 3$$

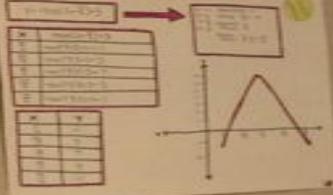
Period =  $\pi$   
 $|A| = 3$   
Horizontal shift =  $\frac{\pi}{2}$   
Vertical shift = 3



Adam's Equation

$$y = 3\sin(2x - \frac{\pi}{2}) + 2$$


GRAPHING COS



x	y
0	3
$\frac{\pi}{2}$	0
$\pi$	-3
$\frac{3\pi}{2}$	0
$2\pi$	3



Mr. Rich Fochtman @MrFochtman206 · 53s  
More projects



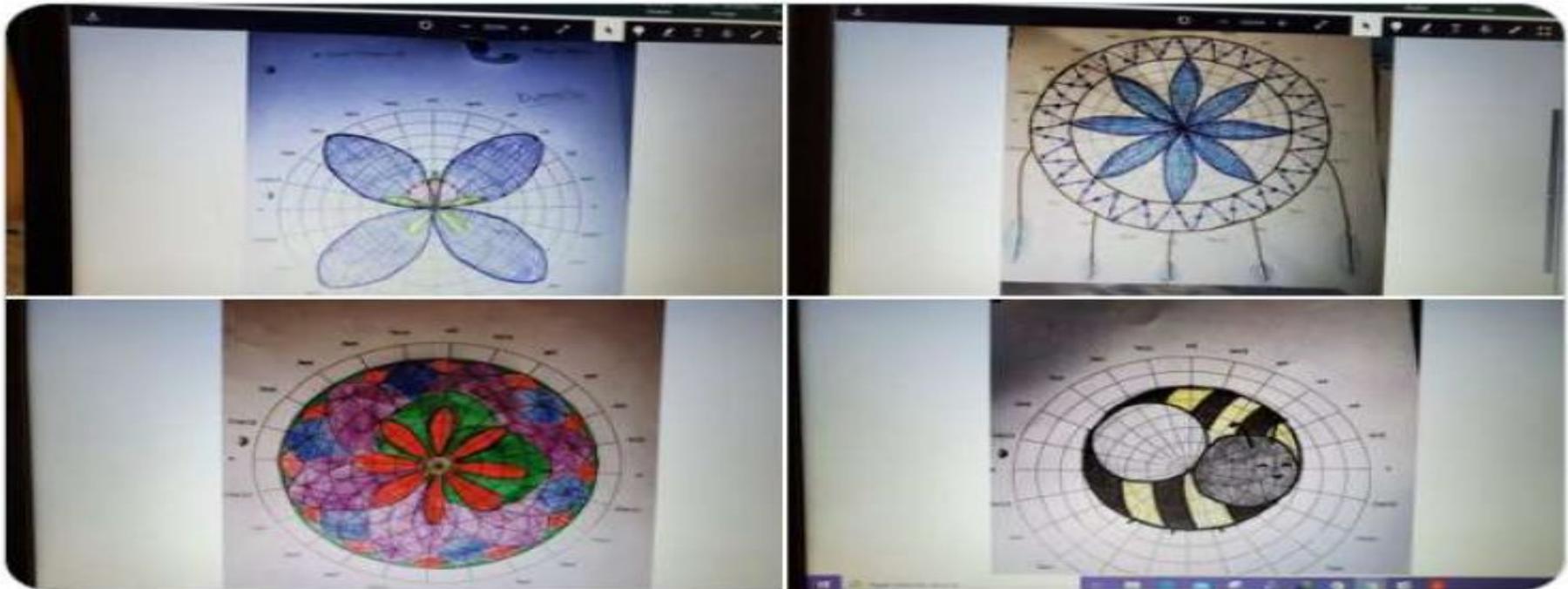
# STUDENT WORK

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**Rich Fochtman** @MrFochtman206 · 1m

Polar Graphing Projects Part 3



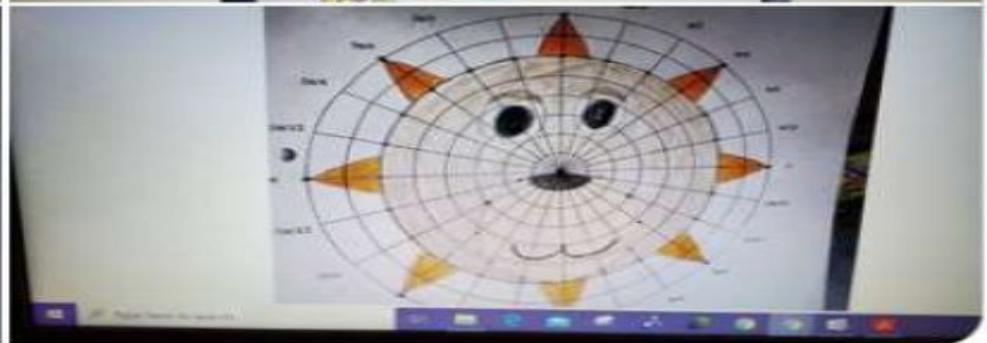
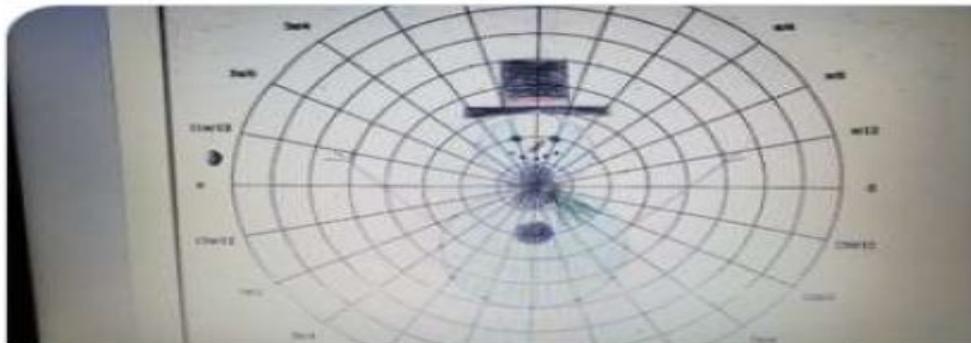
# STUDENT WORK



**Rich Fochtman**  
@MrFochtman206



## Polar Graphing Projects...

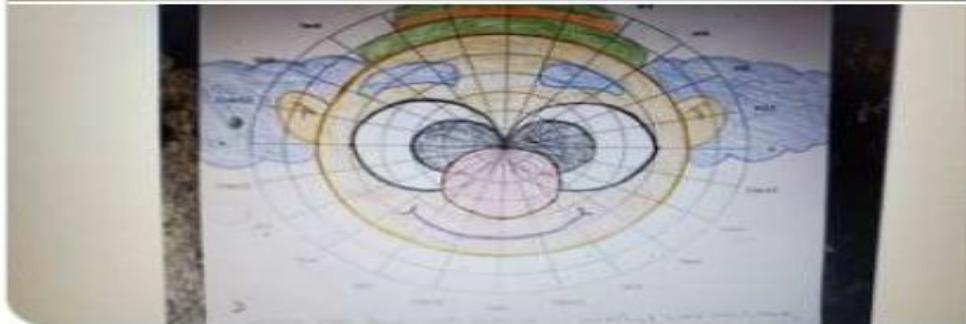
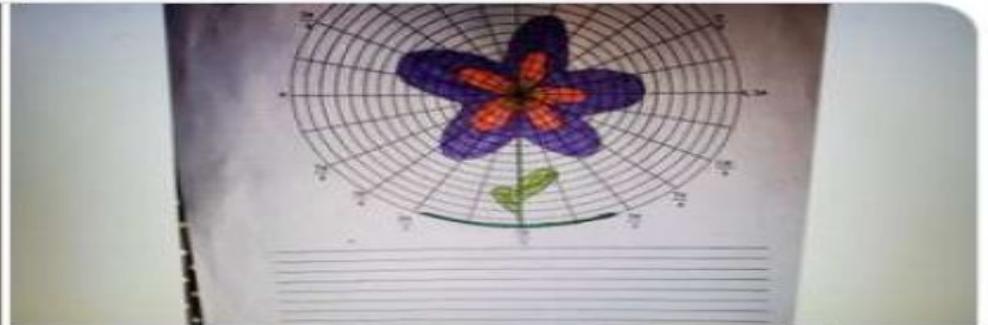
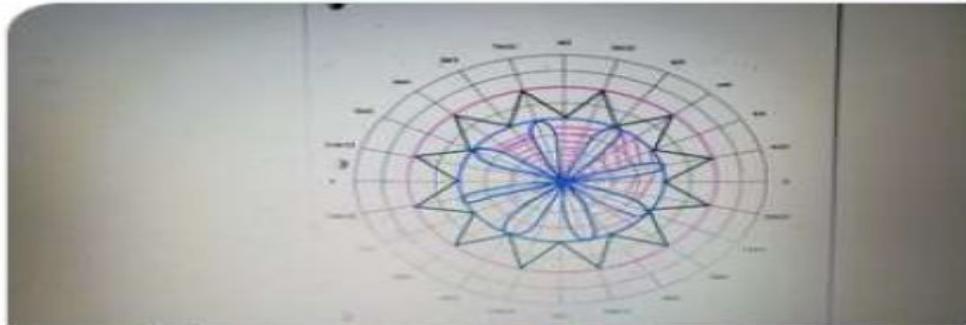


# STUDENT WORK



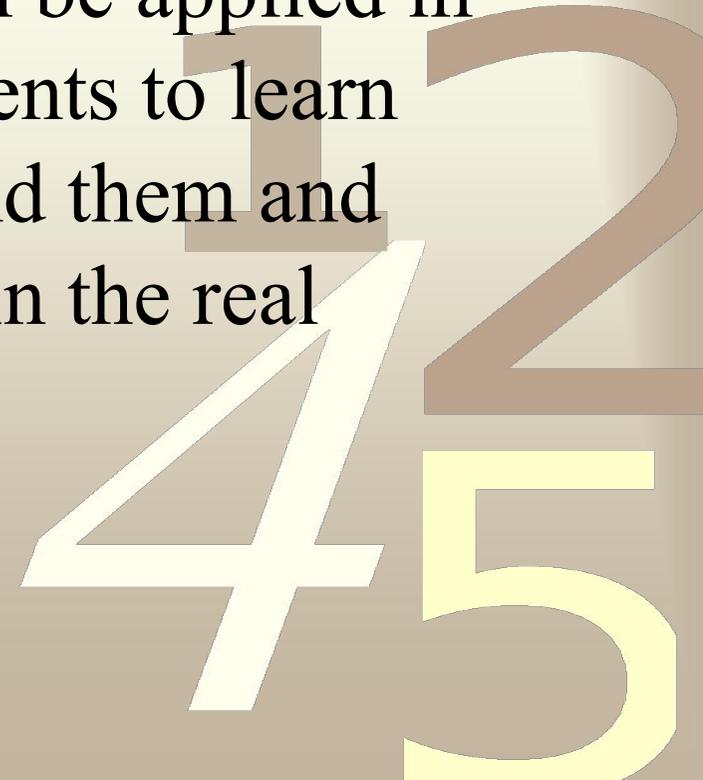
**Rich Fochtman**  
@MrFochtman206

Great job by my Honors Trig/Pre-Calc kids on their Polar Graphing projects. Here are some that were extremely well planned, designed, and constructed!



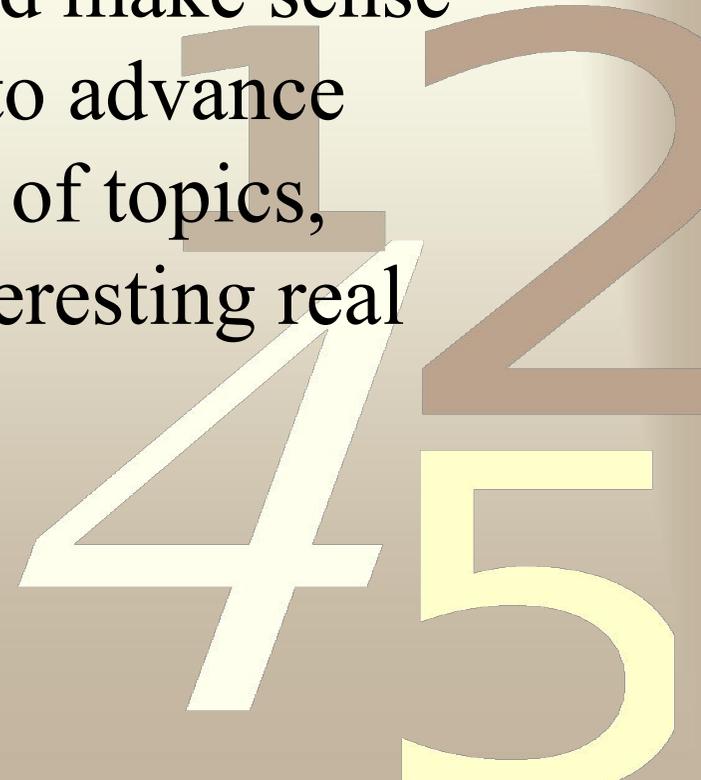
# STUDENT TESTIMONIALS FOR HONORS TRIG/PRE-CALC

“Honors Trig/Pre-Calc allows students to learn more real world connections and how math can be applied in many different occupations. It helps students to learn and understand that math is always around them and how things are engineered and designed in the real world” - Alexa Meyer



# STUDENT TESTIMONIALS FOR HONORS TRIG/PRE-CALC

“Honors Trig/Pre-Calc is an amazing class that allows students to make accurate connections and make sense of math in the world. It enables students to advance their knowledge on an expansive amount of topics, most of which are introduced through interesting real life scenarios.” - Samantha Niggel



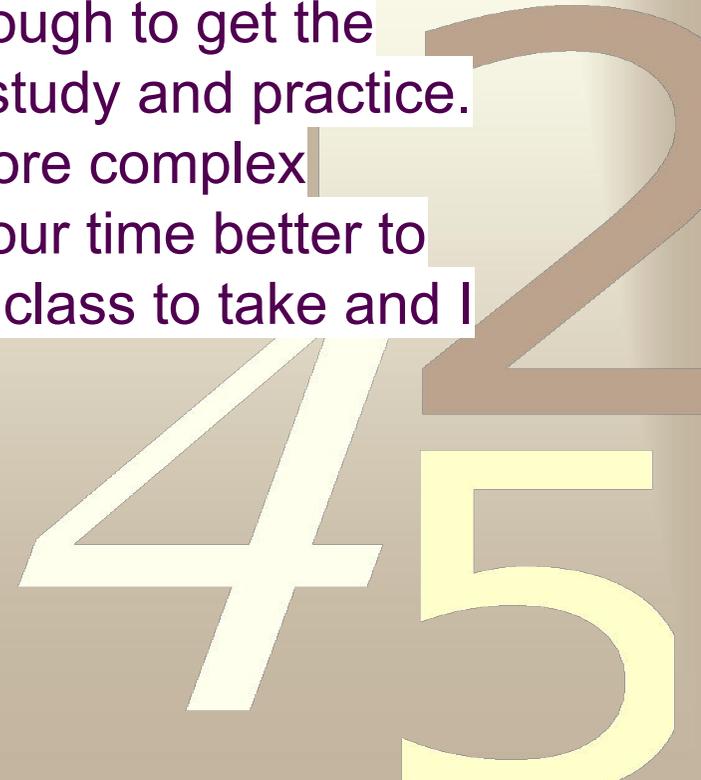
# STUDENT TESTIMONIALS FOR HONORS TRIG/PRE-CALC

“It is important to take trigonometry because it expands on the idea of geometry and goes into a more depth word with angles and Soh-Cah-Toa. Mr. Fochtman does a great job in preparing us for the future as well as explaining how we can use trigonometry in the real world. After taking this class I feel more confident in my math ability and feel very prepared. I would 100% recommend this class for any upcoming lower class-men”. - Brady Lavelle

# STUDENT TESTIMONIALS FOR HONORS TRIG/PRE-CALC

“I would recommend Trig to someone because it will help in the future and in college. The finding of angles and distances is used a lot in science, architecture, engineering, and many more fields. It is tough to get the concept of at first, but it teaches you that you need to study and practice. It will build your math and learning skills to work out more complex challenges in life. You will also learn how to manage your time better to prepare for something. Therefore, Trig is a very useful class to take and I believe everyone should.”

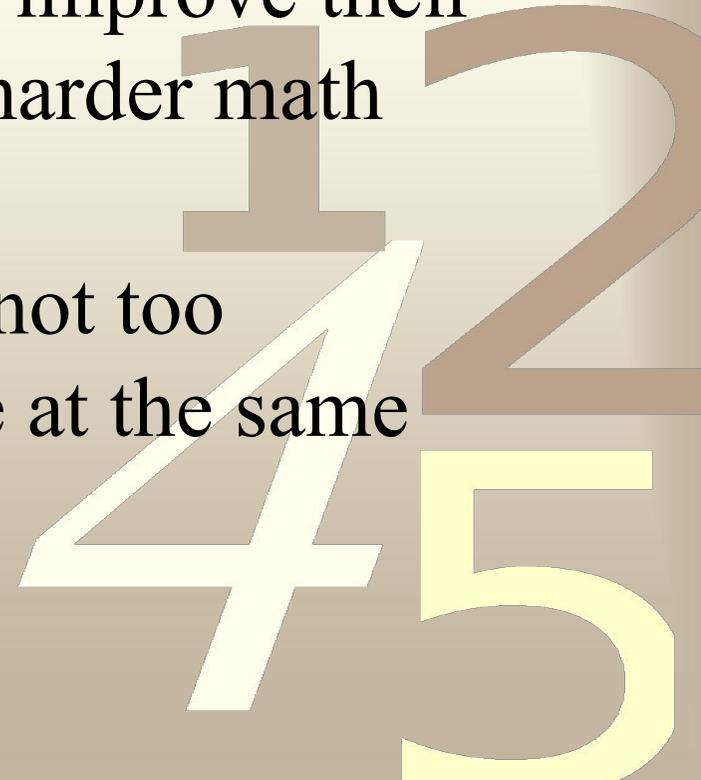
-Abbilyn Rexrode



# STUDENT TESTIMONIALS FOR COLLEGE ALGEBRA

“An incoming junior or senior should take College Algebra/Trig because it will significantly improve their math abilities and help prepare them for harder math courses in college” - J.L.

“It is a chance to try something new, but not too unfamiliar and it prepares you for college at the same time” - A.N.



# STUDENT TESTIMONIALS FOR COLLEGE ALGEBRA

“I think that an incoming junior or senior should take College Algebra/Trig because I think it is just a small step from Algebra 2. I also think if you are planning to attend college that it is a great prep” - N.L.

“You will significantly improve your math abilities and prepare for future math courses” - J.L.