Mathematics eLearning Guide – Week 8

Algebra I: Solve Quadratic Equations

- Students will solve quadratic equations using quadratic formulas.
- Students will determine the number of solutions to the quadratic equation.

Geometry: Circles

- Students will write equations of circles in the coordinate plane.
- Students will graph a circle from its standard equation.
- Students will find the features of a circle from its standard equation.

MMA: Factoring

- Students will understand how to factor by grouping.
- Students will factor a quadratic equation by grouping (leading coefficient $\neq 1$)

Algebra II: Rational Function

- Students will solve rational equations.
- Students will identify extraneous solutions in rational equations.

preCalculus: Arithmetic Series

- Students will evaluate finite arithmetic series.
- Students will write a finite sum using sigma notation.

AP Courses: Calculus AB, Calculus BC, Statistic

- **Content Support** from Khan Academy: **Calculus AB**, **Calculus BC**, **Statistics**
- **AP Resources** from College Board: **Calculus AB**, **Calculus BC**, **Statistics**
- **AP Exam Test Prep** From Shmoop: **Login directions**, **Calculus AB**, **Calculus BC**, **Statistics**

MATH - Algebra 1

Objectives

- Students will be able to solve quadratic equations using quadratic formulas.
- Students will be able to determine the number of solutions to the quadratic equation.

Note: Beginning the week of April 14, and in alignment with our Adjusted Grading Guidelines, teachers in grades 6-12 may assign student work from the Digital Backpack eLearning guide, or from the teacher's itsLearning course, for a grade.

For Parents

- In this unit, your student will learn about solving quadratic equations. Many real-world situations deal with quadratics and parabolas. Throwing a ball, diving from a platform, and hitting a golf ball are all examples of situations that can be modeled by quadratic functions. They are frequently used in physics, engineering, and other sciences.

For Students

Solving Quadratic

- **Task 1 Video:** The Quadratic Formula (**notes**)
- **Task 2 Video:** Quadratic formula examples (negative coefficients)
- **Task 3 Practice:** Quadratic formula (online)
- **Task 4 Video:** Using the quadratic formula: number of solutions (**notes**)
- **Task 5 Practice:** Number of solutions of quadratic equations

Resources

- **Desmos Graphing Calculator**
- **Additional Video: Quadratic Formula**
- **Additional Resource: Quadratic Equations**
- **IXL**

< Week's Overview by SUBJECT

MATH - Geometry

Objectives

- Students will be able to write equations of circles in the coordinate plane.
- Students will be able to sketch a circle given an equation.
- Students will be able to find the features of a circle from its standard equation.

Note: Note: Beginning the week of April 14, and in alignment with our Adjusted Grading Guidelines, teachers in grades 6-12 may assign student work from the Digital Backpack eLearning guide, or from the teacher's itsLearning course, for a grade.

For Parents

- Your students will learn how to write the equation of a circle. This should include circles centered and not centered at the origin. Students will understand what the equation represents in terms of the circle, and be able to sketch a circle given an equation or find the equation of a circle given the center and a point on that circle.

For Students

Arcs and Sectors of Circles

- **Task 1 Video:** Equation of Circles
- **Task 2 Practice:** Graph a circle from its standard equation (online)
- **Task 3 Video:** Features of a circle from its standard equation
- **Task 4 Practice**: Features of a circle from its standard equation(online)
- **Task 5 Video:** Writing standard equation of a circle
- **Task 6 Practice:** Write standard equation of a circle (online)

Resources

- **Additional Practice: Geogebra**
- **Additional Practice: Circles in the Coordinate Plane**
- **Additional videos: Equations of Circles**

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MATH - MMA

Objectives

- Students will be able to factor by grouping.
- Students will be able to factor quadratic by grouping (leading coefficient $\neq 1$).

Note: Beginning the week of April 14, and in alignment with our Adjusted Grading Guidelines, teachers in grades 6-12 may assign student work from the Digital Backpack eLearning guide, or from the teacher's itsLearning course, for a grade.

For Parents

- In this unit, your student will learn about quadratic functions. Many real-world situations deal with quadratics and parabolas. Throwing a ball, diving from a platform, and hitting a golf ball are all examples of situations that can be modeled by quadratic functions. They are frequently used in physics, engineering, and other sciences.

For Students

Factoring Quadratic

- **Task 1 Video:** Intro to grouping (**notes**)
- **Task 2 Video:** Factoring quadratics by grouping(**notes**)
- **Task 3 Practice:** Factoring quadratics by grouping
- **Task 4 Video:** Factoring quadratics: common factor + grouping
- **Task 5 Practice:** factoring quadratic expressions (practice & answer key)

Additional Resources

- **Desmos Graphing Calculator**
- **Additional Video: Factoring quadratics negative common factor + grouping**
- **Additional Practice: Quadratic Factoring Practice**
- **IXL**

< Week's Overview by SUBJECT

MATH - ALGEBRA II

Objectives

- Students will be able to solve rational equations.
- Students will be able to identify extraneous solutions.

Note: Beginning the week of April 14, and in alignment with our Adjusted Grading Guidelines, teachers in grades 6-12 may assign student work from the Digital Backpack eLearning guide, or from the teacher's itsLearning course, for a grade.

For Parents

- Your student will learn how to solve rational equations. A rational function is an algebraic fraction such that both the numerator and the denominator are polynomials. Many real-world problems require us to find the ratio of two polynomial functions (Rational Functions). Problems involving rates and concentrations often involve rational functions.

For Students

Rational Functions

- Task 1 **Video:** Rational equations intro
- Task 2 **Practice:** Rational equations intro (online)
- Task 3 **Video:** Equations with rational expressions (real solution & extraneous solution) example 1
- Task 4 **Video:** Equations with rational expressions (real solution & extraneous solution) example 2
- Task 5 **Practice:** Rational equations (online)

Resources

- Desmos Graphing Calculator
- **Additional Resource:** Solving Rational Equations
- **Additional Practice:** Solving Rational Practice

< Week's Overview by SUBJECT

MATH - preCALCULUS

Objectives

- Students will be able to write a finite sum using sigma notation.
- Students will be able to use the formula for the sum of the first n terms of an arithmetic series.

Note: Beginning the week of April 14, and in alignment with our Adjusted Grading Guidelines, teachers in grades 6-12 may assign student work from the Digital Backpack eLearning guide, or from the teacher's itsLearning course, for a grade.

For Parents

- In this unit, students will learn how to represent arithmetic series using sigma notation. To find the total amount of money in the college fund and the sum of the amounts deposited, we need to add the amounts deposited each month and the amounts earned monthly. The sum of the terms of a sequence is called a series. Summation notation is used to represent series. Summation notation is often known as sigma notation because it uses the Greek capital letter sigma, Σ, to represent the sum. Summation notation includes an explicit formula and specifies the first and last terms in the series.

For Students

Arithmetic Series

- Task 1 **Video:** Intro arithmetic series
- Task 2 **Practice:** Arithmetic series
- Task 3 **Video:** Sigma notation
- Task 4 **Practice:** Arithmetic series (online)
- Task 5 **Practice:** Arithmetic sequences & sums (online)

Resources

- Desmos Graphing Calculator
- **Additional Resources:** Openstax
- **Additional Resources:** Math is fun

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