Mathematics eLearning Guide – Week 6

Algebra I: Quadratic Equations

- Students will factor quadratic equations.

Geometry: Circles

- Students will find the sector area.
- Students will understand the relationship between the sector area and the area of the circle.

MMA: Buying vs leasing

- Students will calculate the total cost of various car loans.

Algebra II: Rational Function

- Students will analyze rational functions.
- Students will identify vertical & horizontal asymptotes.

preCalculus: Parametric Equation

- Students will graph parametric equations.

AP Course: 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 factor by grouping.
- Students will factor quadratic by grouping (leading coefficient ≠ 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 - Geometry

Objectives

- Students will convert between radians and degrees and vice versa.
- Students will find the sector area of a circle.
- Students will understand the proportional relationship between the sector area and the area of the circle.

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 study the proportional relationship between the sector area and the total area of the circle. "Relationships" may or may not include algebraic expressions representing properties. Students may be expected to investigate geometric relationships.

For Students

Arcs and Sectors of Circles

- Task 1 **Video:** Intro to radians
- Task 2 **Video:** Radians & degrees
- Task 3 **Practice**: Radians & degrees (Practice)
- Task 4 **Video:** Sector of a circle
- Task 5 **Video:** Area of a sector
- Task 6 **Practice:** Area of a sector

Additional Resources

- **Extra Resource:** Sector Area
- **Extra Resource:** Determining Area: Sector of Circle
- **Extra Practice:** Radians & degrees

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MATH - MMA

Objectives

- Students will calculate the total cost of various car loans.
- Students will understand the advantages and disadvantages of leasing a motor vehicle.

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 lesson, students are asked to identify costs associated with owning and operating a motor vehicle. Since these costs are commonly underestimated, guidelines are provided on how much to spend when buying vehicles. The material provided in this lesson will address the many factors and decisions involved in purchasing, financing and leasing a vehicle.

For Students

Car Loans

- Task 1 **Video:** Car Loans
- Task 2 **Practice:** How much would you spend? **(answer key)**
- Task 3 **Video:** Buying vs. leasing a car
- Task 4 **Practice**: Auto loans: lease vs. purchases **(answer key)**

Additional Resources

- **Extra Video:** Car Loans
- **Critical Information You Need to Know:** Practical Money Skills

< Week's Overview by SUBJECT

MATH - ALGEBRA II

Objectives

- Students will analyze and interpret the behavior of rational functions, including end behavior.
- Students will identify vertical and horizontal asymptotes.

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 about the behavior of rational functions. 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:** End behavior of rational functions
- Task 2 **Practice:** End behavior of rational functions (online)
- Task 3 **Video:** Rational Functions; Horizontal, Vertical & Oblique Asymptotes -Holes - Domain & Range
- Task 4 **Video:** Rational function points of discontinuity
- Task 5 **Practice:** Rational function points of discontinuity (online)
- Task 6 **Practice:** Rational Functions (practice & answer key)

Additional Resources

- Desmos Graphing Calculator
- Openstax
- **Extra Resource :** Analysis of Rational Functions

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MATH - preCALCULUS

Objectives

- Students will be able to graph parametric equations.
- Students will be able to convert cartesian equations to parametric.

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

- Parametric equations allow the students to actually graph the complete position of an object over time. For example, parametric equations allow you to make a graph that represents the position of a point on a Ferris wheel. All the details like height off the ground, direction, and speed of spin can be modeled using the parametric equations.

For Students

Graph of Parametric Equations

- Task 1 **Video:** Eliminating The Parameter, Graphing Plane Curves
- Task 2 **Practice:** Parametric equations (practice & answer key)
- Task 3 **Video:** Converting from Cartesian to Parametric
- Task 4 **Practice:** Parametric Review ((practice & answer key)

Additional Resources

- Desmos Graphing Calculator
- Openstax

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