Mathematics eLearning Guide – Week 3

Algebra I: Geometric Sequences

- Students will determine if a sequence is geometric.
- Students will find the general term (nth term) of a geometric sequence.

Geometry: Volume & Surface Area

- Students will calculate volume and surface area of spheres using formula.
- Students will calculate the volume and surface area of composite solid shapes.

MMA: Credit

- Students will understand some of the reasons for getting credit.
- Students will understand some of the advantages and disadvantages of using credit.
- Students will understand why banks issue credit.

Algebra II: Base e and Natural Logarithms

- Students will simplify an expression involving natural base and natural logs using the law of exponents.
- Students will evaluate and solve equations involving the natural base and natural logs.

preCalculus: Polar Coordinates

- Students will convert from polar coordinates to rectangular coordinates.
- Students will convert from rectangular coordinates to polar coordinates.
- Students will convert from some of the reasons for getting credit.
- Students will transform equations between polar and rectangular forms.

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**, **Statistic**
- **AP Exam Test Prep** from Shmoop: **Login directions**, **Calculus AB**, **Calculus BC**, **Statistics**

Find online resources at: **http://www.springbranchisd.com/digitalbackpack**

MATH - Algebra 1

Objectives

- Students will determine if a sequence is geometric.
- Students will find the general term (nth term) of a geometric sequence.

Note: Tasks are not intended to be graded. This work is to support understanding of the subject area.

For Parents

- Your student will be building on skills to find the general terms and sum of a geometric sequence. A geometric sequence is a sequence of numbers that follows a pattern where the next term is found by multiplying a constant called the common ratio, r. For example, the following sequence: 3, 6, 12, 24, 48   is a geometric sequence with the common ratio of r = 2   3x2 = 2nd term 6, 6x2 = 3rd term 12….

For Students

Geometric Sequences

- **Task 1** **Video:** Geometric Sequences Intro
- **Task 2** **Video:** Find the Common Ratio
- **Task 3** **Practice:** Geometric Sequences (IXL Practice open to all students for 10 questions)
- **Task 4** **Practice:** Write a formula for a sequence (IXL Practice open to all students for 10 questions).
- **Task 5** **Video:** Explicit Formula
- **Task 6** **Video:** Recursive Formula
- **Task 7** **Practice:** Geometric Sequences (Practice & Answer key)

Resources

- **Additional Video: Geometric Sequence formulas**
- **Additional Practice: Geometric Sequence Lesson & worksheet**

MATH - Geometry

Objectives

- Students will use formulas to calculate the surface area and volume of spheres and hemispheres.
- Students will apply the formulas for the total and lateral surface area of three-dimensional figures, including prisms, pyramids, cones, cylinders, spheres, and composite figures, to solve problems using appropriate units of measure.

Note: Tasks are not intended to be graded. This work is to support understanding of the subject area.

For Parents

- Your students will be building on skills learned in 8th grade to find the surface area and volume of solid shapes(spheres and composite solid shapes). The surface area is the area that describes the material that will be used to cover a geometric solid. The volume is a measure of how much a figure can hold and is measured in cubic units.

For Students

Spheres

- **Task1** **Video:** Volume of Spheres
- **Task 2** **Practice**: Volume of Spheres (Online Practice)

Composite Solid Shapes

- **Task 1** **Video:** Volume of a Composite Shape
- **Task 2** **Video:** Surface Area of Composite Shapes
- **Task 3** **Practice:** Volume of Composite Solid Shapes (Practice & Answer Key)
- **Task 4** **Practice:** Composite Solids Word Problems (Practice & Answer Key)

Resources

- **Additional Video: Volume and Surface Area of Spheres**
- **Additional Practice: Volumes of Composite Solids**
- **Additional Practice: Surface Area of Composite Solids**
- **IXL** (open to all students for 10 questions)

MATH – MMA

Objectives

- Students will understand some of the reasons for getting credit.
- Students will understand some of the advantages and disadvantages of using credit.
- Students will understand why banks issue credit.

Note: Tasks are not intended to be graded. This work is to support understanding of the subject area.

For Parents

- In today's world, credit is integrated into everyday life. From renting a car to reserving an airline ticket or hotel room, credit cards have become a necessary convenience. However, using credit wisely is critical to building a solid credit history and maintaining fiscal fitness. While most students have a general idea about the advantages and disadvantages of credit, this lesson provides an opportunity to discuss these issues in more detail.

For Students

Credit

- **Task 1** **Power Point:** Credit Lesson
- **Task 2** **Practice:** Test Your Credit Knowledge (**Answer Key**)
- **Task 3** **Notes:** How much can you afford?
- **Task 4** **Practice:** How Much Can You Safely Carry? (**Answer Key**)
- **Task 5** **Practice:** Credit Worksheet (**Answer Key**)

Resources

- **Critical Information You Need to Know:** **Credit Card Basics for High School Students**
- **Critical Information You Need to Know:** **Practical Money Skills**

MATH - ALGEBRA II

Objectives

- Students will simplify and evaluate expressions with base e and natural logs using the properties of logs.
- Students will solve equations involving the natural base and natural logs.

Note: Tasks are not intended to be graded. This work is to support understanding of the subject area.

For Parents

- The common type of exponential equation is an equation with base e. This constant occurs again and again in nature, in mathematics, in science, in engineering, and in finance. When we have an equation with a base e on either side, we can use the natural logarithm to solve it.

For Students

Base e and Natural Logarithms

- **Task 1** **Video:** Base e and Natural logarithms
- **Task 2** **Video:** Natural Logarithms Properties
- **Task 3** **Practice:** Base e and Natural logarithms (**Answer Key**)
- **Task 4** **Video:** Solving Exponential logs Equations
- **Task 5** **Practice:** Solving Exponential logs Equations(**Answer Key**)

Resources

- **Desmos Graphing Calculator**
- **Additional Video: Evaluate Natural Logs Expressions**
- **Additional Practice: Natural Exponential Equations**

MATH - PreCALCULUS

Objectives

- Students will plot points using polar coordinates.
- Students will convert from polar coordinates to rectangular coordinates and convert from rectangular coordinates to polar coordinates.
- Students will transform equations between polar and rectangular forms.

Note: Tasks are not intended to be graded. This work is to support understanding of the subject area.

For Parents

- Your student will learn the characteristics of the polar coordinate system. A polar coordinate system is a two-dimensional coordinate system in which each point on a plane is determined by a distance from a reference point and an angle from a reference direction. Polar coordinates are used often in navigation as the destination or direction. For instance, aircraft use a slightly modified version of the polar coordinates for navigation.

For Students

Polar Coordinates

- **Task 1** **Video:** Polar Coordinate and Converting to Rectangular
- **Task 2** **Practice:** Polar Coordinates Practice (**Answer Key**)
- **Task 3** **Video:** Polar to Rectangular Equations
- **Task 4** **Video:** Rectangular to Polar Equations
- **Task 5** **Practice:** Polar and Rectangular Equations (Practice & Answer Key)

Resources

- **Desmos Graphing Calculator**
- **Openstax**
- **Article:** **Polar Coordinates**
- **Additional Notes:** **What is Polar System?**