

SUBJECT AREA: Algebra II with Trigonometry Common Core

GRADE LEVEL: 10,11

SEMESTER: 1,2

| UNIT TITLE/ESSENTIAL QUESTION(S)  | UNIT SKILLS AND CONTENT<br>(Skills should be identified from core content skills identified in Vertical Planning)   | CORE TEXTS AND MATERIALS  | FORMATIVE & SUMMATIVE ASSESSMENTS   | COMMON CORE/CONTENT STANDARDS  |
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| <p><b>Unit 1: Functions</b></p> <p>What is a function and how does it model a relationship between two quantities?</p> <p>How would you write a function that describes a relationship between two quantities?</p> <p>What are the differences and similarities between real and complex solutions of polynomial equations?</p> <p>What makes an equation a function?</p> <p>How can we use our knowledge of functions to</p> | <p>Students will be able to identify if something is a function (given a table, graph, coordinate points, etc.)</p> <p>How do you determine whether a relation is a function, both algebraically and graphically?</p> <p>Students will be able to evaluate a function and a composition function</p> <p>Students will be able to find the domain and range of a function</p> <p>Students will be able to identify the key features of the graph of a function</p> <p>Students will be able to identify parent functions from graphs and equations.</p> <p>Students will be able to identify if a function is one to one</p> | <p><a href="#">Graphing tool</a></p> <p><a href="#">Functions Guide</a></p> <p><b>Video Lessons</b><br/>           Day 1: Defining Functions<br/> <a href="https://screencast-o-matic.com/watch/cY6eF5KosJ">https://screencast-o-matic.com/watch/cY6eF5KosJ</a></p> <p>Day 2: Representing Functions<br/> <a href="https://www.youtube.com/watch?v=r2AazjJPfoo&amp;feature=youtu.be">https://www.youtube.com/watch?v=r2AazjJPfoo&amp;feature=youtu.be</a></p> <p>Day 3: Function Notation<br/> <a href="https://www.youtube.com/watch?v=wDmkHuNl1GI">https://www.youtube.com/watch?v=wDmkHuNl1GI</a></p> <p>Day 4: Composition of Functions (#s only)</p> <p><a href="https://www.youtube.com/watch?v=FOac5Ub0Pbo&amp;feature=youtu.be">https://www.youtube.com/watch?v=FOac5Ub0Pbo&amp;feature=youtu.be</a></p> <p>Day 5: Composition of Functions (variables)</p> | <p><b>Homework:</b> To be given daily on each introduced topic which will be graded.</p> <p><b>Class Discussion:</b> Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.</p> <p><b>Quizzes via Google forms:</b> on concepts involving the current topics which will be graded.</p> <p><b>ixl.com:</b> Skills will be assigned. A score of an 80 or above is the classroom goal and expectation.</p> | <p><b>Emphasize Mathematics Practices 1, 2, 4, 5, 6</b></p> <p>Functions - Interpreting Functions F-IF.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</p> <p>F-IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.</p> <p>F.BF.A.1: Compositions of Functions</p> |

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| <p>find the inverse of a function?</p> <p>Will the inverse of a function always be a function?</p> <p>What is the average rate of change of a function?</p> <p>What are the different types of transformations of functions?</p> <p>How is a graph manipulated through the use of different placements of coefficients in the equation of a graph?</p> | <p>Students will be able to find the inverse of a function both algebraically and graphically</p> <p>Students will realize that if a function is one-to-one then the functions inverse is also a function</p> <p>Students will be able to transform a function by changing the parent function</p> <p>Students will be able to identify translations based off of a parent function and a graph</p> | <p><a href="https://youtu.be/pN1RivpbDWw">https://youtu.be/pN1RivpbDWw</a></p> <p>Day 6: One-to-One Functions<br/><a href="https://screencast-o-matic.com/watch/cY6X3mKReK">https://screencast-o-matic.com/watch/cY6X3mKReK</a></p> <p>Day 7a: Families of Functions<br/><a href="https://www.showme.com/sh/?h=5ms976O">https://www.showme.com/sh/?h=5ms976O</a></p> <p>Day 7b: Function Transformations<br/><a href="http://somup.com/cY6YnClDao">http://somup.com/cY6YnClDao</a></p> <p>Day 8a: Inverse Functions - Graphically<br/><a href="https://www.youtube.com/watch?v=whZHJ007iXY&amp;t=2s">https://www.youtube.com/watch?v=whZHJ007iXY&amp;t=2s</a></p> <p>Day 8b: Inverse Functions - Algebraically<br/><a href="https://youtu.be/zirtC1dktDs">https://youtu.be/zirtC1dktDs</a></p> |  | <p>F-IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.</p> <p>F-IF.8 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p> <p>F-IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).</p> <p>F.BF.B.4 - Find inverse functions.</p> <p>F.BF.B.3 - Identify the effect on the graph of replacing <math>f(x)</math> by <math>f(x) + k</math>, <math>k f(x)</math>, <math>f(kx)</math>, and <math>f(x + k)</math> for specific values of <math>k</math> (both positive and negative); find the value of <math>k</math> given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them (simple radical, rational and exponential functions; emphasize common effect of each transformation across function types)</p> |
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| <p><b>Unit 2: Systems of Equations</b></p> <p>How do I graph a line, given a slope and a y intercept?</p> <p>How can I compare slopes/steepness?</p> <p>How do we solve systems of equations with 2 variables?</p> <p>How do we solve systems of equations with 3 variables?</p> <p>What does solving a system of equations mean graphically?</p> | <p>Students will be able to review solving multi step equations</p> <p>Students will be able to find the slope and y intercept of a function from point slope form</p> <p>Students will be able to graph a line given a function and writing a table of values</p> <p>Students will be able to graph a line given an equation in point slope form</p> <p>Students will be able to tell the difference between zero slope and undefined slope</p> <p>Students will be able to find the solution to a linear system by graphing</p> <p>Students will be able to interpret the solutions to a linear system. One solution, zero solution, infinitely many</p> <p>Students will be able to find the solution to a linear system using elimination (2 variables)</p> <p>Students will be able to find the solution to a linear system by elimination (3 variables)</p> | <p><b>Khan academy System of Equations Video:</b><br/> <a href="https://youtu.be/f7cX-Ar2cEM">https://youtu.be/f7cX-Ar2cEM</a></p> <p><a href="#">Graphing tool</a></p> <p><a href="#">Systems of Equation Guide</a></p> <p><b>Video Lessons:</b><br/> Day 1: Solving Equations<br/> <a href="https://screencast-o-matic.com/watch/cY6OFFsDUC">https://screencast-o-matic.com/watch/cY6OFFsDUC</a></p> <p>Day 2: Solving Equations with fractions/Decimals<br/> <a href="https://www.showme.com/sh/?h=VB0VXP6">https://www.showme.com/sh/?h=VB0VXP6</a></p> <p>Day 3: Rate of Change - Comparing Slopes<br/> <a href="https://youtu.be/06Q7adrj-n8">https://youtu.be/06Q7adrj-n8</a></p> <p>Day 4: System of Linear Equations intro<br/> <a href="https://youtu.be/S7iRHtN6Dq8">https://youtu.be/S7iRHtN6Dq8</a></p> <p>Day 5: Solving Systems of Linear Equations by Elimination<br/> <a href="https://www.showme.com/sh?h=iSdH91s">https://www.showme.com/sh?h=iSdH91s</a></p> <p>Day 6: Solving Systems of Linear Equations by Elimination day 2<br/> <a href="https://www.showme.com/sh?h=oroeM7s">https://www.showme.com/sh?h=oroeM7s</a></p> | <p><b>Homework:</b> To be given daily on each introduced topic which will be graded.</p> <p><b>Class Discussion:</b> Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.</p> <p><b>Quizzes via Google forms:</b> on concepts involving the current topics which will be graded.</p> <p><b>Ixl.com:</b> Skills will be assigned. A score of an 80 or above is the classroom goal and expectation.</p> | <p><b>Emphasize Mathematics Practices 1, 3, 4</b></p> <p>F-IF.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.</p> <p>A.REI.C.5<br/> Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.</p> <p>A.REI.C.5<br/> Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.</p> <p>A.REI.C.6: Solving Linear Systems 3 variables</p> |
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|   |  | <p>Day 7: Solving Systems with Three Variables<br/> <a href="https://youtu.be/fO_gj3a__B8">https://youtu.be/fO_gj3a__B8</a></p>  |   |  |
| <p><b>Unit 3: Quadratic functions and factoring</b></p> <p>What are the different ways that we can factor quadratic equations?</p> <p>What do these factors mean?</p> <p>How can we find the zeros given a graph?</p> <p>Can you find the equation of a polynomial given its factors?</p> | <p>Students will be able to identify a quadratic function</p> <p>Students will be able to factor a quadratic function using the GCF</p> <p>Students will be able to factor a trinomial and find the factors of a quadratic trinomial</p> <p>Students will know what it means to factor completely</p> <p>Students will be able to factor by grouping, by using the zero property and by completing the square.</p> <p>Students will be able to complete the circle by using the completing the square method.</p> <p>Students will be able to identify properties of given quadratic functions.</p> <p>Students will be able to graph quadratic functions.</p> <p>Students will be able to solve a quadratic equation by graphing and determining the zeros.</p> | <p><a href="#">Factoring guide for all types of factoring:</a></p> <p><a href="#">Finding the roots of a polynomial guide</a></p> <p><a href="#">Desmos Activity</a></p> | <p><b>Homework:</b> To be given daily on each introduced topic which will be graded.</p> <p><b>Class Discussion:</b> Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.</p> <p><b>Quizzes via Google forms:</b> on concepts involving the current topics which will be graded.</p> <p><b>ixl.com:</b> Skills will be assigned. A score of an 80 or above is the classroom goal and expectation.</p> | <p><b>Emphasize Mathematics Practices 1, 2, 5</b></p> <p>F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima.</p> <p>F.IF.4, F.IF.8, F.IF.8c, F.IF.9 Graphing Quadratic Functions</p> <p>A.SSE.3a Factor a quadratic expression to reveal the zeros of the function it defines.</p> |

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| <p><b>Unit 4: Radical Equations, Exponents, Quadratic Formula</b></p> <p>How do we simplify Radicals?</p> <p>How do we add, subtract, multiply and divide radicals?</p> <p>How do we rationalize the denominator of fractions?</p> <p>How do we solve radical equations?</p> <p>Why is it necessary to check the possible solutions for extraneous roots when solving a radical equation?</p> <p>How can you create quadratics to model real-world problems and use the quadratic formula to solve?</p> <p>How do we go from radical form to fractional exponent form and visa versa?</p> | <p>Students will be able to identify and solve a radical function</p> <p>Students will be able to solve square root equations</p> <p>Students will be able to identify basic properties of exponents</p> <p>Students will be able to evaluate exponents and fractional exponents</p> <p>Students will be able to solve quadratic equations using the Quadratic Formula.</p> <p>Students will be able to find roots of polynomials by using the Quadratic Formula instead of factoring.</p> | <p><a href="#">Fractional exponent guide</a></p> <p><a href="#">Change from radical form to fraction exponent form</a></p> <p><a href="#">Solving radical equations guide</a></p> <p><a href="#">Real World Quadratic Formula Activities</a></p> | <p><b>Homework:</b> To be given daily on each introduced topic which will be graded.</p> <p><b>Class Discussion:</b> Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.</p> <p><b>Quizzes via Google forms:</b> on concepts involving the current topics which will be graded.</p> <p><b>Ixl.com:</b> Skills will be assigned. A score of an 80 or above is the classroom goal and expectation.</p> | <p><b>Emphasize Mathematical Practices 1, 2, 3, 4, 5</b></p> <p>A.REI.A.2 - Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise</p> <p>N.RN.A.1 - Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. <i>For example, we define <math>5^{1/3}</math> to be the cube root of 5 because we want <math>(5^{1/3})^3 = 5^{(1/3)3}</math> to hold, so <math>(5^{1/3})^3</math> must equal 5</i></p> <p>N.RN.A.2 - Rewrite expressions involving radicals and rational exponents using the properties of exponents. Includes expressions with variable factors, such as the cubic root of <math>27x^5y</math></p> <p>A.REI.B.4b - Solve quadratic equations by inspection (e.g., for <math>x^2 = 49</math>), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as <math>a \pm bi</math> for real numbers <math>a</math> and <math>b</math></p> |
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| <p>Why must we put the quadratic in standard form before using the Quadratic formula?</p> <p>How can the quadratic formula be used to find solutions to quadratic functions?</p> <p>When would you use the quadratic formula to find the roots of a quadratic function?</p>  |  |   |  |   |
| <p><b>Unit 5: Complex Numbers</b></p> <p>How are the powers of <math>i</math> derived and how are they cyclic?</p> <p>Why does the discriminant determine the number and nature of the roots to a quadratic equation and how does it relate to the Quadratic Formula?</p> <p>What are imaginary and complex numbers?</p> | <p>Students will discover what imaginary numbers are and where to find them on a graph</p> <p>Students will be able to perform operations with complex numbers (add, subtract, multiply).</p> <p>Students will be able to perform operations with complex numbers (divide).*</p> <p>Students will be able to determine the nature of the roots of a quadratic function using the discriminant</p> <p>Students will be able to leave answers in a + bi form</p> | <p><a href="#">Discovery of imaginary numbers video</a></p> <p><a href="#">Imaginary numbers guide</a></p> <p><a href="#">Multiplying complex numbers guide</a></p> <p><a href="#">Complex numbers in real life</a></p> | <p><b>Homework:</b> To be given daily on each introduced topic which will be graded.</p> <p><b>Class Discussion:</b> Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.</p> <p><b>Quizzes via Google forms:</b> on concepts involving the current topics which will be graded.</p> | <p><b>Emphasize Mathematics Practices 1, 2, 5</b></p> <p>N.CN.1 Know there is a complex number <math>i</math> such that <math>i^2 = -1</math>, and every complex number has the form <math>a + bi</math> with <math>a</math> and <math>b</math> real.</p> <p>N.CN.2 Use the relation <math>i^2 = -1</math> and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.</p> <p>N.CN.C.7 - Solve quadratic equations with real coefficients that have complex solutions</p> |

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| <p>How do we add, subtract, multiply and divide complex numbers?</p>   | <p>Students will be able to understand that we can not combine imaginary numbers and real numbers</p> <p>Students will be able to solve a quadratic equation with complex roots.</p>   |  | <p><b>Ixl.com:</b> Skills will be assigned. A score of an 80 or above is the classroom goal and expectation.</p>  |  |
| <p><b>Unit 6: Power functions, polynomials, rational functions</b></p> <p>How can we use our knowledge of quadratics to identify other power functions and their qualities?</p> <p>How many solution(s) does a linear/quadratic/cubic equation have?</p> <p>What is the relationship between the degree of the polynomial and how many x-intercepts it has?</p> <p>How do we identify a rational function and how can we use its operations to solve the equation?</p> | <p>Students will be able to identify power functions that are not quadratic functions</p> <p>Students will be able to identify a rational function</p> <p>Students will be able to simplify rational functions</p> <p>Students will be able to determine the multiplicity of a polynomial</p> <p>Students will be able to find and use x-intercepts to graph a function</p> <p>Students will be able to graph a polynomial without using a calculator</p> <p>Students will be able to find the relative maximum and minimum of a polynomial function</p> <p>Students will be able to add/subtract rational functions</p> | <p><a href="#">Polynomial &amp; Rational Functions Resources</a></p> <p><a href="#">Polynomial &amp; Rational Functions Guide</a></p> <p><a href="#">Graphing Tool to check for the number of roots</a></p> <p><a href="#">Row Game - Simplifying Rational Expressions</a></p> | <p><b>Homework:</b> To be given daily on each introduced topic which will be graded.</p> <p><b>Class Discussion:</b> Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.</p> <p><b>Quizzes via Google forms:</b> on concepts involving the current topics which will be graded.</p> <p><b>Ixl.com:</b> Skills will be assigned. A score of an 80 or above is the classroom goal and expectation.</p> | <p><b>Emphasize Mathematics Practices 1, 2, 4, and 7</b></p> <p>A.CED.A.1 - Create equations and inequalities in one variable and use them to solve problems (linear, quadratic, exponential (integer inputs only), simple roots)</p> <p>A.APR.B.3 - Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial</p> <p>A.APR.C.4 - Prove polynomial identities and use them to describe numerical relationships. <i>For example, the polynomial identity <math>(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2</math> can be used to generate Pythagorean triples</i></p> <p>A.APR.D.6 - Rewrite simple rational expressions in different forms; write <math>\frac{a(x)}{b(x)}</math> in the form <math>q(x) + r(x)/b(x)</math>, where <math>a(x)</math>, <math>b(x)</math>, <math>q(x)</math>, and <math>r(x)</math> are polynomials with the degree of <math>r(x)</math> less than the degree of <math>b(x)</math>, using inspection, long division, or, for the</p> |

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|   | <p>Students will be able to solve rational equations using addition and subtraction</p> <p>Students will be able to multiply/divide rational functions</p> <p>Students will be able to use long division to find the factors of a power polynomial</p> <p>Students will be able to find the zeroes of polynomials</p> <p>Students will be able to identify the remainder theorem and what it shows about polynomials</p>                               |   |  | <p>more complicated examples, a computer algebra systems</p>  |
| <p><b>Unit 7: Exponential and Logarithmic Functions</b></p> <p>How can we use exponent laws to simplify expressions?</p> <p>How can we use exponents and exponential functions to evaluate real life scenarios?</p> <p>What is the difference between exponential growth and decay?</p> | <p>Students will be able to quantify negative exponents and evaluate rational exponents</p> <p>Students will be able to multiply and divide common bases of exponents</p> <p>Students will be able combine multiplying common bases with rational and integer exponents</p> <p>Students will be able to identify exponential growth and decay through graphs and solving word problems</p> <p>Students will be able to graph the log of a function</p> | <p><a href="#">Exponential &amp; Logarithmic Function Resources</a></p> <p><a href="#">Kuta Software Algebra 2 Worksheet/Test Generator</a></p> <p><a href="#">Regents Questions</a></p> <p><a href="#">Exponential Growth Penny Activity</a></p> | <p><b>Homework:</b> To be given daily on each introduced topic which will be graded.</p> <p><b>Class Discussion:</b> Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.</p> <p><b>Quizzes via Google forms:</b> on concepts involving the current topics which will be graded.</p> | <p><b>Emphasize Mathematics Practices 1, 2, 4, 5, and 7</b></p> <p>N.RN.A.1 - Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. <i>For example, we define <math>5^{1/3}</math> to be the cube root of 5 because we want <math>(5^{1/3})^3 = 5^{(1/3)3}</math> to hold, so <math>(5^{1/3})^3</math> must equal 5.</i></p> <p>N.RN.A.2 - Rewrite expressions involving radicals and rational exponents using the properties of exponents. Includes expressions with variable factors, such as the cubic root of <math>27x^5y</math></p> <p>A.SSE.B.3c - Choose and produce an equivalent form of an expression to reveal and explain properties of the</p> |

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| <p>Why do we logarithms in order to solve certain exponential equations?</p> <p>How do you convert between exponential and logarithmic form?</p> <p>What are natural logarithms and when do we use them?</p> <p>How do you use the concept of exponential growth to work with the principle of compound interest?</p> <p>Why would it be important to understand how compound interest works? \$\$</p> | <p>Students will be able to identify e, the natural log</p> <p>Students will be able to use logs to find compound interest and lease rates</p> <p>Students will be able to understand the importance of investing money</p> <p>Students will be able to provide multiple real-world examples of exponential functions.</p> |  | <p><b>ixl.com:</b> Skills will be assigned. A score of an 80 or above is the classroom goal and expectation.</p>  | <p>quantity represented by the expression. Use the properties of exponents to transform expressions for exponential functions. <i>For example the expression <math>1.15^t</math> can be rewritten as <math>(1.15^{1/12})^{12t} \approx 1.012^{12t}</math> to reveal the approximate equivalent monthly interest rate if the annual rate is 15%</i></p> <p>F.IF.C.7e - Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. Focus on using key features to guide selection of appropriate type of model function.</p> <p>F.LE.4 For exponential models, express as a logarithm the solution to <math>abct = d</math> where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.</p> |
| <p><b>Unit 8: Sequences and Series</b></p> <p>How do we identify patterns in numbers?</p> <p>What formulas can we use to solve sequences?</p> <p>What is the difference between an arithmetic sequence and an arithmetic series?</p>   | <p>Students will be able to identify an arithmetic and geometric sequence and how they relate to different functions</p> <p>Students will be able to identify the difference between a recursive and explicit formula</p>  | <p><a href="#">Sequences and series website help</a></p> <p><a href="#">Sequences and serious resources</a></p> <p><a href="#">Desmos Activity Builder</a></p> | <p><b>Homework:</b> To be given daily on each introduced topic which will be graded.</p> <p><b>Class Discussion:</b> Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.</p> | <p><b>Emphasize Mathematics Practices 1, 2, 4, and 7</b></p> <p>F.IF.A.3 - Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. <i>For example, the Fibonacci sequence is defined recursively by <math>f(0) = f(1) = 1</math>, <math>f(n+1) = f(n) + f(n-1)</math> for <math>n \geq 1</math></i></p> <p>F.BF.A.2 - Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate</p>  |

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| <p>How do we solve real world problems using sequences?</p> <p>What is the difference between a geometric sequence and a geometric series?</p> <p>How do we solve real world problems involving series?</p> | <p>Students will be able to identify a geometric series and how it relates to summation</p> <p>Students will be able to identify patterns in sequences identify arithmetic and geometric sequences</p> <p>Students will be able to find the nth term in an arithmetic or geometric sequence</p> <p>Students will be able to calculate using the formula for arithmetic or geometric sequence</p> <p>Students will be able to identify the patterns in real-world applications</p> <p>Students will be able to identify arithmetic and geometric series</p> <p>Students will be able to operate with summation notation</p> <p>Students will be able to calculate the sum of a series using a formula</p> <p>Students will be able to understand what the difference between a geometric sequence and a geometric series is</p> |  | <p><b>Quizzes via Google forms:</b> on concepts involving the current topics which will be graded.</p> <p><b>Ixl.com:</b> Skills will be assigned. A score of an 80 or above is the classroom goal and expectation.</p> | <p>between the two forms (linear, exponential, quadratic A-SSE.4. Derive the formula for the sum of a finite geometric series</p> |
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| <p><b>Unit 10: The Circular Functions (Trigonometry)</b></p> <p>How can we use trigonometry to find the value of different angles and measures?</p> <p>What is a radian?</p> <p>What is the unit circle?</p> <p>How do you convert angle measures between degrees and radians and why would this conversion be necessary?</p> <p>How can sine, cosine, and tangent functions be defined using the unit circle?</p> <p>Why is the Theorem of Pythagoras so essential?</p> <p>What are periodic functions?</p> | <p>Students will be able to determine the side lengths of right triangles by using trigonometric functions.</p> <p>Students will be able to draw angles in standard position.</p> <p>Students will be able to convert angles measures between degrees and radians.</p> <p>Students will be able to find the values of trigonometric functions on the unit circle.</p> <p>Students will be able to find the values of trigonometric functions on the unit circle.</p> <p>Students will be able to recognize and graph trigonometric functions.</p> <p>Students will be able to know when to use the pythagorean theorem</p> | <p><a href="#">Unit Circle Printables - Drawing Activity</a></p> <p><a href="#">Unit Circle Paper Plate Activity</a></p> <p><a href="#">Unit Circle Guide</a></p> <p><a href="#">The Circular Functions Resources</a></p> <p><a href="#">Modeling a Periodic Function Activity</a></p> | <p><b>Class Discussion:</b><br/>Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.</p> <p><b>Quizzes via Google forms:</b> on concepts involving the current topics which will be graded.</p> <p><b>Ixl.com:</b> Skills will be assigned. A score of an 80 or above is the classroom goal and expectation</p> | <p><b>Emphasize Mathematics Practices 2, 4, 5, 7</b></p> <p>F.TF.1 Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.</p> <p>F.TF.2 Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.</p> <p>G.SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.</p> <p>G.SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.</p> <p>F.TF.5 Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.</p> |
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| <p><b>Unit 11: Probability &amp; Statistics</b></p> <p>What are the different ways in which data can be organized and analyzed?</p> <p>Why do we study normal distributions?</p> <p>Why is random sampling of a population done when a census is impractical?</p> <p>Do experimental probabilities match theoretical probabilities?</p> <p>How can a researcher select a method of collecting data with as little bias as possible?</p> <p>How does the mean or proportion of a sample compare to the mean or proportion of the population?</p> <p>What is a margin of error?</p> | <p>Students will be able to identify the intersection and union of a set of data</p> <p>Students will be able to summarize, represent, and interpret data.</p> <p>Students will be able to make inferences and justify conclusions from sample surveys and experiments.</p> <p>Students will be able to identify if two events are dependent or independent</p> <p>Students will be able to find conditional probabilities using a data table</p> <p>Students will be able to multiply the probability of multiple events</p> <p>Students will be able to understand that probability can be used to develop strategies and make informed decisions.</p> <p>Students will be able to identify the difference between variability, sampling and experiments</p> <p>Students will be able to find the normal distribution of data and the z-scores of this distribution</p> <p>Students will be able to identify the difference between sample mean</p> | <p><a href="#">Great online resource for questions</a></p> <p><a href="#">Probability Resources</a></p> <p><a href="#">Statistics Resources</a></p> <p><a href="#">Probability &amp; Statistics Guide</a></p> <p><a href="#">Quarter Flipping Activity</a></p> <p><a href="#">Various High School Activities</a></p> | <p><b>Class Discussion:</b><br/>Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.</p> <p><b>Quizzes via Google forms:</b> on concepts involving the current topics which will be graded.</p> <p><b>Ixl.com:</b> Skills will be assigned. A score of an 80 or above is the classroom goal and expectation</p> | <p><b>Emphasize Mathematical Practices 1, 2, 3, 4, 5, 6, and 7</b></p> <p>S.CP.A.1 - Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”)</p> <p>S.CP.A.2 - Understand that two events <math>A</math> and <math>B</math> are independent if the probability of <math>A</math> and <math>B</math> occurring together is the product of their probabilities, and use this characterization to determine if they are independent</p> <p>S.CP.A.3 - Understand the conditional probability of <math>A</math> given <math>B</math> as <math>P(A \text{ and } B)/P(B)</math>, and interpret independence of <math>A</math> and <math>B</math> as saying that the conditional probability of <math>A</math> given <math>B</math> is the same as the probability of <math>A</math>, and the conditional probability of <math>B</math> given <math>A</math> is the same as the probability of <math>B</math>.</p> <p>S.CP.A.4 - Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. <i>For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly</i></p> |
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|  | and standard deviation and use this to find the margin of error                              |                                 |  | <p><i>selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results</i></p> <p>S.CP.A.5 - Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. <i>For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer</i></p> <p>S.CP.B.6 - Find the conditional probability of <math>A</math> given <math>B</math> as the fraction of <math>B</math>'s outcomes that also belong to <math>A</math>, and interpret the answer in terms of the model</p> <p>S.CP.B.7 - Apply the Addition Rule, <math>P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)</math>, and interpret the answer in terms of the model.</p> |
| <p><b>Unit 12: Focus &amp; Directrix</b></p> <p>How can we derive the equation of a parabola</p> | Students will be able to write the equation of a parabola when given the focus and directrix | <a href="#">Desmos Activity</a> | <p><b>Class Discussion:</b></p> <p>Students will be expected to be prepared for class, participate in class activities and</p> | <p><b>Emphasize Mathematical Practices 2, 4 and 6</b></p> <p>G.GPE.A.2-Derive the equation of a parabola given a focus and directrix</p>  |

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| <p>given a focus and directrix?</p> | <p>Students will be able to understand the difference between focus and directrix</p> |  | <p>actively engage in class discussion.</p> <p><b>Quizzes via Google forms:</b> on concepts involving the current topics which will be graded.</p> <p><b>Ixl.com:</b> Skills will be assigned. A score of an 80 or above is the classroom goal and expectation</p> |  |
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